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TABLE OF CONTENTS

GRACE ARTHUR. An Attempt to Sort Children with Specific Reading Disability from Other Non-Readers 251
EDWARD A. LINCOLN. Tentative Standards for the Lincoln Hollow Square Form Board 264
THOMAS R. GARTH. The Intelligence of Mixed Blood Indians ... 268
HERBERT D. WILLIAMS. Truancy and Delinquency 276
FLORENCE M. TEAGARDEN. Change of Environment and the I.Q. 289
DAVID GRAUER AND W. T. ROOT. The Thorndike Intelligence Tests and Academic Grades 297
NOTES AND NEWS 319
BOOK REVIEWS 322
NEW BOOKS AND PAMPHLETS 330

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AN ATTEMPT TO SORT CHILDREN WITH SPECIFIC READING DISABILITY FROM OTHER NON-READERS

GRACE ARTHUR

Child Guidance Clinic, St. Paul, Minn.

In a Child Guidance Clinic one meets many children who have not learned to read. Some of these children have never had instruction in reading. Many had been admitted to Grade I when they had reached a chronological age of six years, but had failed to profit by one or two years of regular instruction because they had not yet attained a mental age of six. Others have failed to learn in spite of good instruction and adequate mental age because of some physical handicap such as defective vision or defective hearing. Still others, while normal mentally and physically have failed to profit by instruction owing to emotional factors that have entered into the reading situation either at school or at home. And finally, there is a small group who seem to have a specific reading disability.

It is, as a rule, fairly easy to determine when a child has failed to receive ordinary instruction. It is also fairly simple to obtain an IQ with a Binet scale and to determine the probable mental age at the time of school entrance. If this mental age was less than six, the failure to learn is readily understood. The presence of physical defect is also relatively easy to determine during the routine physical examination. The children who have not been adequately conditioned for meeting the learning-to-read situation, or who have been conditioned against it because of some early school experience, learn rapidly when re-conditioning has been effected. But with these groups eliminated, there remains a residue who, with adequate mental age, with no gross physical handicaps, and with a painful eagerness to learn, still have not learned to read under the usual school instruction.

The present study is an attempt to determine a method by means of which this last group can be sorted out from non-readers who are failing because of emotional difficulties. The problem is interesting from a purely scientific point of view.

TABLE 1

CASE	SEX	C.A.	M.A.	I.Q.	PER. I.Q.	D-1	VOC.	VOC. I.Q.	D-2	R
Readers										
1	B	8-6	7-0	82	89	+7	14.5	86	+4	Gray I 100″ 9E
2	B	8-4	8-0	96	103	+7	17	92	−4	Gray II 170″ 16E
3	G	7-1	8-2	115	107	−8	13	99	−13	Gray II 78″ 9E
4	B	6-7	7-4	111	87	−24	11	106	?	Gray II 210″ 21E
5	B	10-0	7-10	78	78	±0	18.5	78	±0	Gray I 24 2E
6	G	9-4	8-2	88	82	−6	−	−	−	Gray II 179 7E
7	B	6-0	7-7	126	101	−25	11.5	<113	?	Gray I 98″ 9E
8	B	7-5	7-5	100	99	−1	14	95	−5	Gray I 34 2E
9	B	7-0	7-0	100	100	±0	10.5	<100	?	Gray I 109″ 11E
10	B	8-4	6-8	80	86	+6	8	?	?	Gray I 100 10E
11	B	7-7	7-7	100	−	−	−	−	−	Gray I 65 5E
12	G	7-2	7-6	105	106	+1	16.5	109	+4	Gray I 49 2E
Non-readers										
1	B	9-1	9-4	103	98	−5	14.5	78	−25	Gray I 89″ 10E
2	B	11-11	8-5	71	82	+11	14	60	−11	Gray I 79″ 7E
3	B	9-9	7-5	76	99	+23	6	<72	−>4	Gray I 72″ 9E
4	B	9-9	7-11	81	94	+13	8.5	<72	−>9	Gray I 67 6E
5	B	9-1	7-9	85	92	+7	11.5	<77	−>8	Gray I 75″ 10E
6	B	9-9	8-1	83	113	+20	13.5	72	−11	Gray I 92″ 11E
7	B	11-1	10-0	90	105	+15	28.5	88	−2	Gray I 74 4E*
8	B	14-1	9-10	70	90	+20	23	60	−10	Gray I 72″ 5E*
9	B	8-5	8-6	101	115	+14	23	105	+4	Gray I 81″ 7E
10	B	10-10	8-8	80	94	+14	12.5	<65	−>15	Gray I 32″ 2E
11	B	10-3	9-1	89	101	+12	11.5	<68	−>21	Gray I 38″ 3E
12	B	12-0	11-4	94	124	+30	20.5	70	−24	Gray II 155″ 8E
13	B	11-7	10-2	88	96	+8	26	80	−8	Gray I 29″ 1E
14	G	10-3	8-8	85	90	+5	10	<68	−>17	Gray II 146 12E

*Cases 7 and 8 had no reading vocabulary when the study was begun. These reading scores were obtained four months later when the learning of list XIV had been completed.

But it has also a practical value, as the emphasis in teaching these two groups of non-readers is very different. The emotional group may need teaching, but their greatest need is motivation. With re-conditioning effected, many a child who is failing because of emotional difficulty recovers with no special teaching other than the friendly help of the mother or sister. One mother reported: "He did not need to learn to read. He needed to learn that he knew how to read." The group with a specific reading difficulty may need re-conditioning, after a long history of failure, but their greatest need is teaching suited to meet their specific difficulties. The chances are that the members of this group are already over-motivated. To attempt to teach the emotional group without re-conditioning them is a useless waste of effort. To further motivate the group with specific reading disability without providing a means by which they can learn is nothing less than cruel. We should be able to find a means by which we can determine to which group any non-reading child belongs.

Fourteen cases of non-readers are presented in table 1 for comparison with twelve cases of normal reading achievement. It would be impossible to compare the non-readers with normal children of the same mental age, as the reading achievement would be so different for the two groups as to make comparisons of little value. It is necessary, rather, to match the groups approximately as to degree of oral reading achievement, as the ease of learning any new word is affected by the number of words previously learned. The non-readers are subdivided into two smaller groups: (a) nine cases that, after two or more years of reading instruction *after a mental age of six was attained*, were still unable to reach the norm for the end of Low I on Gray's Oral Reading Check Test, and (b) five cases that, after three or more years of instruction *after a mental age of six was attained* were still unable to reach the norm for the end of Low II on the Gray test. The normal readers with whom the non-readers are compared are children who have had not more than two years of reading instruction *after a mental age of six was attained.* They have all made some progress in learning to read, but no case is

included that was able to reach the norm for the end of Low II on the oral reading test. As a rule, not less than two trials, on parallel forms were given to determine the degree of oral reading achievement.

It is highly probable that the non-reading group includes some children in whom emotional difficulties are more important factors in determining degree of reading difficulty than are the intellectual factors. On the other hand, the reading group might easily include some children who, in spite of some degree of reading disability, have made approximately normal progress because of adequate teaching. The "normal" group, moreover, is perhaps less normal than the average public school group, in that half of the cases are repeaters. This would seem to be an advantage rather than a disadvantage, however, as it tends to make the Binet IQ's of the two groups more nearly comparable.

From the standpoint of mental age, chronological age, amount of instruction and reading achievement, the advantage lies with the non-reading group. In Binet IQ the advantage lies with the group of readers.

Column 1, table 1, gives the case number. Column 2 gives the sex. Under C.A. is given the chronological age at the time the study was made. M.A. is the mental age obtained with the Binet scale. IQ indicates the Binet IQ Under Per. is given the IQ obtained with the Point Performance Scale.[1] D-1 gives the difference between the Binet IQ and the Performance IQ. Under Voc. is the IQ yielded by the vocabulary test alone. D-2 gives the difference between the Binet IQ and the Vocabulary IQ. The last column, R, gives the oral reading achievement as measured by the Gray Oral Reading test.

One notices first, in column 2, the heavy percentage of boys among the non-readers. Fortunately, the percentage of boys in the control group also is heavy. Inspecting the third column we note the absence of high average and superior Binet ratings

[1] Arthur, Grace. A new Point Performance Scale. Journal of Applied Psychology, ix, December, 1925, pp. 390–416.

among the non-readers. Such cases of non-readers with high Binet ratings as have appeared at the Clinic have responded promptly to instruction as soon as physical and emotional difficulties were relieved. No cases were included in which the IQ was below 70, as it is desired in this study to report normal children with a special disability, rather than to add one more report to the studies of the subnormal. Some of these ratings were obtained with the Kuhlmann-Binet scale; some were obtained with the Stanford-Binet. In either case, with one exception, the Binet rating falls below that obtained with the Point Performance Scale. On that scale, the non-readers make a better showing. The average (median) difference between the Binet rating and the Performance rating, for the non-readers is 13.5 points of IQ. Dr. Kuhlmann suggested that one would naturally expect the lower IQ to be more successful in the concrete situations of the Performance Scale than in the more abstract situations of the Binet Scale. To determine the general tendency for dull children, all clinic cases with a Binet IQ below 95 were assembled. The median difference between the Binet and the Performance Scale IQ's was ± 0. There does not seem to be any general tendency therefore, on the part of dull children to score higher on the performance scale than on the Binet. The tendency may be regarded as characteristic of these non-readers. Following up this suggestion that a non-reader fares poorly on a verbal scale, vocabulary scores were translated into IQ ratings. These tend to fall below the Binet rating as consistently as the Performance IQ tends to fall above it. It is possible that the Terman vocabulary norms are too high for the average child, but they were used on the assumption that they were standardized upon the same groups as the rest of the Stanford-Binet scale. IQ's could not be worked out for scores falling below the 7-year norm. From these two comparisons we are led to wonder whether our non-readers are not essentially non-verbalists? Apparently they fare very well until speech enters into a situation, but the more purely verbal the situation becomes, the greater is their disadvantage. The median difference between the Binet IQ and the vocabulary

TABLE 2

		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV
		MEAT	HONEST	WAIT	WHICH	SEATS	GREEN	JERKY	SOUR	SQUARE	CRESCENT	BICYCLE	NAIL	CHISEL	FRIENDLY
Readers															
a	1	3	5	7	4	3	2	7	3	3	6	3	5	4	8
	2	2	5	3	3	2	2	10	4	3	5	3	4	3	15
	3	2	3	4	6	3	1	5	4	2	13	4	6	12	4
	4	6	4	4	5	4	2	6	6	6	6	5	4	4	7
	5	2	3	3	2	3	1	3	2	2	6	4	2	4	4
	6	4	3	3	2	3	2	2	3	3	5	3	4	3	4
	7	3	6	6	5	6	2	7	7	5	7	4	6	8	9
	8	6	7	6	5	4	1	9	4	5	7	3	4	5	5
	9	6	13	8	7	7	3	16	7	5	11	7	5	8	15
	10	3	13	20*	8	8	3	13	6	6	9	16	6	28*	18§
	11	4	9	6	12	4	3	8	7	7	14	10	14	13	17‖
	12	5	5	3	4	2	1	3	5	3	4	5	2	6	21
		3.5	5	5	5	3.5	2	7	4.5	4	6.5	4	4.5	5.5	8.5
Non-readers															
b	1	5	11	9	8	7	4	7	4	2	6	4	7	11	12
	2	9	15	10	19	5	2	6	8	3	5	4	4	5	18
	3	6	19	11	18	10	3	14	6	5	20	10	4	5	31
	4	7	15	6	11	6	3	10	6	3	7	5	4	8	16
	5	4	19	19†	6	8	3	11	8	3	14	5	16	8	27
	6	4	26	10	15	7	3	7	8	7	4	8	8	21	30*
	7	4	6	4	7	4	3	4	3	5	4	3	4	3	4
	8	2	15	4	10	5	3	8	7	2	3	4	2	3	12
	9	3	6	5	9	4	2	3	5	2	4	2	3	3	7
		4	15	9	10	6	3	7	6	3	5	4	4	5	16
c	10	3	3	4	4	4	2	4	3	4	4	4	3	6	12
	11	2	6	3	4	2	3	5	4	3	10*	3	7	5	14
	12	1	2	4	4	2	2	3	2	2	4	2	3	3	4
	13	2	2	3	6	2	2	4	3	3	2	2	2	1	12
	14	2	2	3	2	2	1	4	5	2	7	3	4	4	6‡
		2	2	3	4	2	2	4	3	3	4	3	3	4	12

* DNC.

† Patient was scolded for manifest inattention. Effort improved.

‡ This was one of the first cases to be tested. No word of list XIV was pronounced correctly: all successes were approximate.

§ DNC; wept; test discontinued.

‖ DNC; poor effort.

IQ is more than nine points: how much more we cannot determine with our present norms.

Because of the small number of cases, it does not seem worth while to attempt any elaborate statistical treatment of results. We cannot expect to reach any conclusions on the basis of a purely preliminary study, but we should be able to formulate some interesting questions that will point the way in further investigation.

Table 2 is the outcome of experience with a foreign population. It had been noted that verbs and nouns were learned rapidly, while adverbs and prepositions were learned very slowly. That is, concrete words were taken on rapidly while words of relationship, which are essentially abstract, were slow to be assimilated. It seemed worth while to see if the non-readers found a similar difference in difficulty between abstract and concrete words. Four lists of five words each were prepared. The first list was made up of four-letter concrete words: meat, fire, step, blue, soap. The second list was composed of six-letter abstract words: honest, gentle, dirty, brave, happy. List III contained four-letter verbs: wait, sign, need, save, turn. These were always defined in such a way as to insure the verb meaning. List IV contained five and six-letter words of relationship: which, along, beside, within, during. Each word was typed on a strip of light-weight, unglazed, buff cardboard. The five words of each list were placed together in an envelope. The words were presented to the subject one at a time in chance order. The order was changed for each repetition of the series. If the subject could not name the word, it was named for him and then turned face down before the next word was exposed. The first time a word was presented it was defined. Each list was repeated until all the words in it were correctly named.

These lists were tried out on four readers[2] and four non-readers of approximately equal mental and chronological age. There proved to be a marked contrast between the two groups.

[2] All control cases were obtained through the courtesy of Miss Margaret Weikert, Superintendent of the Children's Preventorium of Ramsey County, Minnesota.

Both groups found List I relatively easy. The readers found List II easy. The non-readers found List II very difficult. The readers found List III harder than List II. The non-readers found it much easier. Both groups found List IV the hardest of the lists then presented, but the non-readers found it relatively much harder than did the readers. The consistency of the results suggested that these and other lists might furnish a means of differentiating children with a specific reading disability from other non-readers. Length of word and meaning both seemed to be factors in determining the ease or difficulty of the word for the non-reader.

When these first lists and the results obtained with them were shown to Professor Lashley, he suggested that emotional connotation as well as denotation might be a factor in determining the difficulty of a given word for a given child. Lists V to XIV were then prepared. List V contained words denoting physical activity: skate, sleep, throw, slide, chase. List VI was made up of colors: green, brown, purple, yellow, orange. List VII was made up of words with kinesthetic connotation: jerky, heavy, quick, silky, rough. List VIII consisted of words with taste connotation: sour, bitter, acid, oily, salt. List IX had names of familiar geometric forms: square, circle, heart, star, moon. List X was made up of less familiar geometric forms: crescent, diamond, oval, oblong, triangle. As each word of these two lists was presented a picture of the form was exposed and left where the child could refer to it. List XI contained eight and nine-letter words: bicycle, elevator, radiator, automobile and broadcast. List XII was made up of four and five-letter nouns connected with carpentry: nail, file, vise, plane, screw. List XIII was made up of longer or less familiar names of tools: chisel, hammer, lumber, wrench, rivet. List XIV contained the most difficult of all the words presented to the subject. They were eight and nine-letter abstract words: friendly, unhealthy, impolite, generous, peculiar.

The results obtained with these lists are shown in table 2. They are listed separately for (a) readers, (b) non-readers failing to reach the norm for the end of Low I, and (c) non-readers

failing to reach the norm for the end of Low II. It is evident from a very casual inspection, that little can be inferred from merely the number of repetitions required to learn the different lists. But, as in the preliminary experiment, there seems to be a good deal of significance in the relative difficulty in learning different types of words. Names of colors are the easiest for both the readers and the non-readers, and the difference between the groups in ease of learning these words is non-significant. The non-reader, then, is not a non-reader so far as color names are concerned!

The picture presented by the first four cases in learning Lists I to IV is repeated in the scores of those failing to reach the norm for the end of Low I in oral reading, except in two instances. The pattern is . The most difficult list for both readers and non-readers is XIV. The comparison of results for List XI with results for List XIV shows a marked difference between the two groups. It requires only 2.3 times as many repetitions for the average reader to learn List XIV as it does to learn List XI, while it takes 3.5 times as many repetitions for the average non-reader of either group. Only three non-readers have as low a ratio XIV:XI as the average reader. Comparing Lists I and II in the same fashion we find that the average ratio of the number of repetitions required to learn List II to the number of repetitions required to learn List I is 1.8 for the readers, and 2.82 for the non-readers. For those failing to reach the norm for the end of Low I it is 3.49. Of those failing to reach the norm for the end of Low I, only two have as low a II:I ratio as the average reader. This ratio does not clearly separate the non-readers with higher achievement from the readers, yet only two of the five fail to make as low a ratio as the average reader.

In tables 1 and 2 we thus appear to have data that should enable us to separate the readers from the non-readers with some degree of success. We have an average difference of 13.5 points between the Binet and Performance Scale IQ for the non-reader, as compared with a median difference of ± 0 for 64 other cases with Binet IQ below 95. We found a median difference of more than nine points of IQ between the Binet

rating and the vocabulary rating, in favor of the Binet as compared with a theoretical difference of zero for the groups upon which the tests were standardized. There seems to be a characteristic pattern representing the relative difficulty of the first four lists for the non-readers. The relative difficulties of Lists II and I and of Lists XIV and XI separate readers from non-

TABLE 3

Recovered cases

	SEX	C.A.	M.A.	I.Q.	PER. I.Q.	D-1	VOC.	VOC. I.Q.	D-2	R
1	B	8-11	8-8	97	85	−12	24	100	+3	Gray I 27″ 4E
2	B	7-11	8-8	109	106	−3	15	93	−16	Gray I 143″ 6E
3	B	7-6	8-4	111	109	−2	18	107	−4	Gray I 121″ 14E
4	B	7-8	8-0	104	81	−23	24	117	+13	Gray I 55″ 4E

Readers cured

	MEAT	HONEST	WAIT	WHICH	SKATE	GREEN	JERKY	SOUR	SQUARE	CRESCENT	BICYCLE	NAIL	CHISEL	FRIENDLY
1	2	2	3	3	2	1	5	3	2	4	4	3	2	4
2	2	2	2	2	2	1	3	3	2	3	2	1	3	4
3	2	3	2	2	4	3	3	2	5	8	6	2	3	10
4	2	2	3	2	(omitted)						4	(omitted)		4

	B:P	B:V	II:I	XIV:XI	I-IV
1	−	−	−	−	−
2	−	+	−	−	−
3	−	−	−	−	−
4	−	−	−	−	−

readers with only a small degree of overlapping. Regarding these five comparisons as tests, and giving a "plus" whenever a case behaves like the average non-reader, or, in the case of the ratios, when it fails to behave as a reader, we can obtain a score for each case. If we decide arbitrarily that three plus signs out of a possible five entitle us to classify the case as one of special

reading disability we find that all but three of the non-readers are included. Of the reading group none are included.

As stated above, we have no guarantee that all the subjects who have failed to learn to read because of emotional difficulties have been eliminated from the non-reading group. Every effort was made to insure proper motivation, but there remains the possibility that, for any given subject, the trouble continues to be purely emotional. It is interesting, however, to inspect the scores of subjects who have made rapid recovery, without any change in teaching method, as soon as emotional difficulties were eliminated or markedly reduced. By recovery is meant the ability to carry school work without help, and the habit of reading for pleasure. We find scores for the four such subjects, for whom complete scores are available, in table 3. Again the number of subjects is too small for the results to be anything more than suggestive, but the consistency with which these children identify themselves with the reading group rather than with the non-reading group lends color to the assumption that by means of these five tests we can sort out children who may be expected to recover with proper motivation and any kind of teaching by which the average child learns, from those who, because of specific intellectual peculiarities must be given teaching that will meet their specific needs.

With an adequate number of subjects it would seem to be entirely feasible to substitute sigma values for the plus signs, to total and average the sigma scores and to determine the total sigma score that would separate readers from non-readers most completely.

Table 4 presents the plus and minus scores for each of the non-readers, and for each of the readers for whom they could be obtained. Case 7 of the non-readers yielded the most interesting results. In only two of the five comparisons is he aligned with the non-readers. We had known there was a profound emotional reaction to any reading situation, but had always regarded it as secondary to the intellectual difficulty. He had been brought to the attention of the Clinic because he had fainted when sent with a group of other boys to read for the

superintendent. Nobody had suspected his total failure to learn to read as he had always been able to "get by" with the help of a good memory. He had learned, under special in-

TABLE 4

	1 B:P	2 B:V	3 II:I	4 XIV:XI	5 I:IV
			Readers		
1	−	−	−	+	−
2	−	−	+	+	−
3	−	−	−	−	−
4	−	?	−	−	−
5	−	−	−	−	−
6	−	0	−	−	−
7	−	+	+	−	−
8	−	−	−	−	−
9	−	?	+	−	−
10	−	?	+	+	−
11	0	0	+	−?	+
12	−	−	−	+	−
			Non-readers		
1	−	+	+	+	−
2	−	+	−	+	+
3	+	?	+	+	+
4	−	+	+	+	+
5	−	+	+	+	−
6	+	+	+	+	+
7	+	−	−	−	+
8	+	+	+	+	+
9	+	−	+	+	+
10	+	+	−	+	−
11	−	+	+	+	+
12	+	+	+	−	−
13	−	−	−	+	−
14	−	+	−	−	−

struction, in the slow, painstaking fashion of the boy with a special reading disability rather than with the rapid recovery that is more apt to accompany re-conditioning. Case 13 had

been regarded as an emotional problem. Case 14 had been regarded as due to poor teaching and lack of motivation. It may be, however, that what seems like explanation may be rationalization.

Following Dr. Lashley's suggestion as to individual variations in difficulty resulting from differences in interest, we find in table 2 that cases 1 and 7 of the non-readers are the only ones of group b to find names of taste sensations as easy to learn as names of colors. These boys have long been singled out by the other children as gluttons. Case 8 of the non-readers, on the other hand, found taste words difficult, but had learned without help several words that appear in the lists of tools. His score on the Stenquist Assembling Test is, according to the Stenquist norms, equalled or exceeded by only 2.9 per cent of boys of his age. *Bicycle* and *automobile* are easy words for every child tested. *Generous* and *peculiar* are difficult.

Complexity and meaning appear to be the two principal factors in determining the difficulty of any word, both for readers and non-readers. The only difference revealed between the groups is one of degree. Both groups behave in identical fashion when they get beyond their depth. When either a reader or a non-reader begins to flounder, he can be rescued either by defining the word for him, with the printed word concealed from view to prevent extra repetitions, or by improving his pronunciation of it. That is, in either case we clear up the situation not by additional efforts to teach reading, but by an interlude in which we teach the child to talk. In the course of the work, it was interesting to notice the rapidity with which the printed symbol was connected with the correct geometric form. On the second exposure of the word *crescent* or *triangle* the child would point to the correct form, while it might take fifteen or twenty repetitions before he could name the word.

For eight of the non-readers infantile speech, oral inactivity or poor enunciation are recorded, as compared with two of the readers, although the readers are the younger group.

TENTATIVE STANDARDS FOR THE LINCOLN HOLLOW SQUARE FORM BOARD

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This form board was devised by the writer for the purpose of providing for the examination of very young children (three to six) a test of this type which would be easy to handle and convenient to carry as part of a traveling clinician's equipment. A description of the board, together with a photograph, has been published in connection with the descriptions of the other performance tests of the Harvard series,[1] but the standards available at the time of publication were not satisfactory. It is the purpose of the present article to publish new standards, and also to offer for consideration a new and seemingly useful method for standardizing such a test.

For the benefit of those who do not know this form board it may be described briefly as follows: In a board 7½ inches by 10 inches by ⅝ inches is cut a hole 4½ inches square. There are also eleven blocks, eight of them differing in shape, and with these pieces there may be made different combinations which exactly fill up the hole. The pieces are numbered inconspicuously, and on the board, also inconspicuously, are stamped the numbers of the blocks which make up each of the eight combinations used for the different problems. When the test is given, the square is placed on a table or other flat surface with the pieces laid out conveniently. The examiner selects the pieces for the separate problems in their proper order, and gives them to the subject, with instructions to fill up the hole with them. The first problem is so easy that practically any sub-

[1] Dearborn, W. F. A Series of Formboard and Performance Tests of Intelligence. Harvard Monographs in Education, No. 4. Graduate School of Education, Harvard University, Cambridge, Mass.

ject who can understand the directions is successful. One minute is allowed on each problem, so the whole test may be completed in little more than ten minutes.

The great difficulty in standardizing an individual test, whether it is of the performance or any other type, lies in the large amount of time which is required to examine a number of cases sufficiently large to give reliable norms. Even in a test like the Hollow Square, which may be given in a short time, it requires many hours' work to build up the norm for a single age, and thus many of the form board tests have been put into use before they have been adequately standardized.[2] Such tests, however, have been widely used by psychologists, not for the obtaining of mental or performance age, but for the purpose of observing the reactions of their subjects. Used in this way, the form boards and other performance tests have proved of great importance.

In the course of this use of performance tests a large number of records have been piled up in various clinics, but they have not been considered as material suitable for use in standardization because of the selection of the cases. It is such material that the writer has used in his present attempt to derive norms for the Hollow Square, and it seems that this method may be applied to other tests of a similar nature.

More than 450 cases were used in this study, 100 of them from the Hospital for Sick Children at Toronto, Canada, about 30 from a private school near Cambridge, and the remainder from the two Habit Clinics in Boston. For the clinic cases mental age records were available and this fact made possible the present method of study.

In handling the data[3] three distinct series of distributions were made: (1) Distributions of total time scores by chrono-

[2] An excellent example of this is the Dearborn Formboard No. 3. It was devised in 1906, and has been very widely used in clinical work, but has never been standardized on normal children.

[3] The statistical work for this study was done by Miss Pauline Dodge of the Department of Mathematics of the Somerville High School, Somerville, Mass.

logical ages for all cases; (2) distributions of total time scores by chronological ages for all cases with IQ's between 90 and 109, inclusive (Terman's normal group); and (3) distributions

TABLE 1

Median total time for the separate groups by age

AGE	CHRONOLOGICAL AGE, TOTAL		C.A., 90–109 I.Q.		MENTAL AGE	
	Seconds	N	Seconds	N	Seconds	N
2.5	425	6			430	6
3.5	410	16			381	33
4.5	357	31			363	41
5.5	318	37	323	15	322	52
6.5	300	60	310	23	285	68
7.5	249	68	230	19	227	75
8.5	244	77	223	27	209	53
9.5	198	45	180	14	184	53
10.5	190	38	175	13	173	20
11.5	207	26			135	12
12.5	180	22			150	5
13.5	190	18			125	7

TABLE 2

Proposed standards

SECONDS	AGE	SECONDS	AGE
450	2.0	290	6.5
430	2.5	260	7.0
410	3.0	230	7.5
390	3.5	220	8.0
375	4.0	210	8.5
360	4.5	195	9.0
340	5.0	185	9.5
320	5.5	175	10.0
305	6.0		

of total time scores by mental ages. The assumptions on the basis of which the two latter distributions were used are, first, that the performance of the normal part of a group will give the

same average as the group as a whole, and, second, that a distribution for any mental age will give the same central tendency as the distribution for the corresponding chronological age. This is true for the usual group and individual intelligence tests, and it seems reasonable to suppose that the relationship holds for performance tests as well.

The medians of these distributions are set down in table 1. It will be seen that in spite of the small number of cases in the normal IQ group the medians of these distributions are surprisingly close to the medians of the mental age distributions. Only in year six is the difference marked. The chronological age medians for the whole group are rather close to the mental age medians in the early years except in the third year, and further away in the years after six. This difference may be explained by the fact that the older children constituted a more inferior group than did the younger. The median IQ's after seven years range from 86 to 77.

The means of the three series shown in table 1 were plotted together, and the norms presented in table 2 were selected after study of the graph. These norms must be considered tentative, but they should prove helpful to those clinicians who are using the Hollow Square.

SUMMARY

1. This article presents a possible method for standardizing individual tests by the use of records obtained in clinical examinations, particularly when mental ages are available. The essence of this method is the finding of central tendencies from distributions in mental age groups and in groups whose IQ's fall in the 90–109 interval.

2. By use of this method tentative age norms are derived for the Lincoln Hollow Square form board.

THE INTELLIGENCE OF MIXED BLOOD INDIANS

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There have been published two previous studies in which the intelligence of mixed blood Indians has been examined by means of group intelligence tests. One of these is that of Hunter assisted by Sommermeir (1) in which the Otis Group Intelligence Test was used. The other is that by Garth (2) in which he used the National Intelligence Test-Form A. In the first study the investigators found the intelligence of mixed bloods, as tested, superior to that of full bloods but inferior to that of Whites. They found also a positive correlation of 0.51 between degree of white blood and score. In the second study age for age comparisons showed a tendency for mixed blood Indians to be 27 per cent better in scores than full blood Plains and Southeastern Indians. The present study differs from the first study, that of Hunter and Sommermeir, in that a somewhat larger group of mixed bloods is handled and a different test is used. It differs from that of Garth in reporting on a larger group with the same test. But it differs from both studies in that Group-IQ's are used instead of test scores.

While this is the first time a study of mixed blood I.Q. has been reported a median N.I.T.-IQ for full blood Indians from a group of 1050 was indicated by Garth[1] assisted by Serafini and Dutton (3) in 1925. This median N.I.T.-IQ for full blood Indians was found to be 68.6, Q. 10.3. In this study

[1] A preliminary report of this study was made before the American Psychological Association at Philadelphia, December 29, 1926. An abstract of same appears in Psychological Bulletin, xxiv, 3.

it was found that N.I.T.-IQ slightly tended to increase with school grade, but only slightly.

In this study the mixed blood Indians vary in degree of Indian blood from one-sixteenth Indian to seven-eighths Indian blood, the measures being based on reports obtained from the records of the United States Schools where the Indians were tested. The Indian subjects of this experiment were students in the United States Indian schools of Rapid City, South Dakota; Pine Ridge Reservation Indian School and Holy Rosary Mission School at Pine Ridge, South Dakota;[2] United States Indian School at Pierre, South Dakota; Indian Schools at Rosebud, South Dakota; and United States Indian School at Chilocco, Oklahoma.[3] Following is a statement of the blood composition of the group studied:

Degree of Indian blood..	1/4	7/16	3/8	5/16	1/2	3/8	1/4	1/8	1/16	0*	Total
Number of cases:	89	10	114	20	318	44	95	7	1	67	765

*Whites.

In order to make a continuous scale and in order to have at least five steps in this scale the steps were taken in units of one-fourth of a degree of Indian blood. To the original data of mixed bloods were added, as is seen from the above, eighty-nine full bloods and sixty-seven white N.I.T.-IQ's. With the change the distribution reads:

Degree scale.....	1/4–7/16	3/8–5/16	1/2–1/16	1/4–1/16	0	Total
Frequency.....	99	134	362	103	67	765

However, in an early phase of this study it was found wise to separate the 3/4 degree, 1/2 degree and 1/4 degree groups for special study in order to get an approach to the problem thus tempo-

[2] The writers acknowledge the assistance of Mr. Finis Johnson in administering tests at Pine Ridge and Holy Rosary Mission Schools and for assistance in handling the data.

[3] Part of the data was obtained on an expedition made possible by a grant from the Grant Committee of the American Association for Advancement of Science in 1921.

rarily eliminating all other degrees. Table 1 gives the distributions of the N.I.T.-IQ's for these degrees. The scores of some of these 765 subjects of the study were so low that it was impossible to express them as mental ages, so their IQ's were left undetermined, but below IQ 50. For this reason medians

TABLE 1

Showing N.I.T.-IQ's for mixed blood Indians of three fourths, one-half, and one-fourth degree of Indian blood

N.I.T.-IQ SCALE	¾ DEGREE FREQUENCY	½ DEGREE FREQUENCY	¼ DEGREE FREQUENCY
130–134.9			
125–129.9			
120–124.9			1
115–119.9		2	1
110–114.9		1	4
105–109.9	1	6	0
100–104.9	1	8	2
95–99.9	3	16	6
90–94.9	8	23	4
85–89.9	10	23	13
80–84.9	16	39	8
75–79.9	14	44	15
70–74.9	23	39	10
65–69.9	18	36	8
60–64.9	6	27	6
55–59.9	5	12	5
50–54.9		2	
Undetermined	9	40	12
Total.....	114	318	95
Median.....	74.1	75.3	77.5
Q.../.....	8.0	10.9	11.1

and quartiles are used in table 1 for measures of central tendency and variability of the groups.

The ages of these subjects range from 8 years to 21 years, but no chronological age above sixteen was used since any one above that was regarded as no more than that in order to bring this study into relation with a rather prevalent theory

that mental ages on the average are not more at most, than sixteen. The mental age equivalent of a score for a subject was divided by that subject's respective chronological age with the above restriction of counting no age above sixteen, to obtain the N.I.T.-IQ. The IQ was used in order, again, to bring this study into relation with a prevalent trend in racial studies of intelligence, of expressing intelligence of racial groups in terms of IQ.

These mixed blood and full blood Indians were found in the United States Indian School, as we have said and the sixty-seven whites were taken from the average white population. The distribution of school grade runs thus but for those only for whom IQ's could be found:

School grade	3rd	4th	5th	6th	7th	8th	Total
¼–⅞ degree	4	14	22	27	14	18	99
¾–1/8 degree	27	109	124	139	89	48	536
Whites	1	11	23	14	9	9	67
Total							702

There were sixty-three for whom IQ's could not be found.

As will be shown schooling has very little effect on the I.Q. as here found. This is consistent with the notion prevailing in some quarters that IQ's will not vary with education but we do not here intend to say that schooling has no effect absolutely for such as there is must be taken into consideration.

With these above facts we may proceed to ask ourselves these questions, viz., (1) What light does this experiment throw on the problem of racial types of intelligence? (2) What effect does degree of Indian blood have on N.I.T.-IQ? (3) What effect does education have on the N.I.T.-IQ?

It is held by Thorndike (4) that "no case is known of a mental trait appearing in three sharply defined degrees—0, moderate, and full amount—with clear gaps between, as a unit character should" . . . . "In traits in which race makes a great difference there will tend to be a mode for each racial type if two extreme races are mixed." Previous studies have shown the N.I.T.-IQ to be a varying quantity for full blood

Indians with a median of 68.3, Q. 10.3, as above indicated. The median for Whites is found to be 100 IQ. Intelligence varies for both Whites and Indians and when we mix the two races getting ¾ Indian, ½ Indian, and ¼ Indian with reciprocal degrees of white blood we get of course IQ's in varying degrees of amount. (See table 1 and figure 1.) The median N.I.T.-IQ's for the respective degrees of Indian blood are 74.1, Q. 8.0; 75.3, Q. 10.9; 77.5, Q 11.1. That these groups differ from full bloods in intelligence is evident however for the

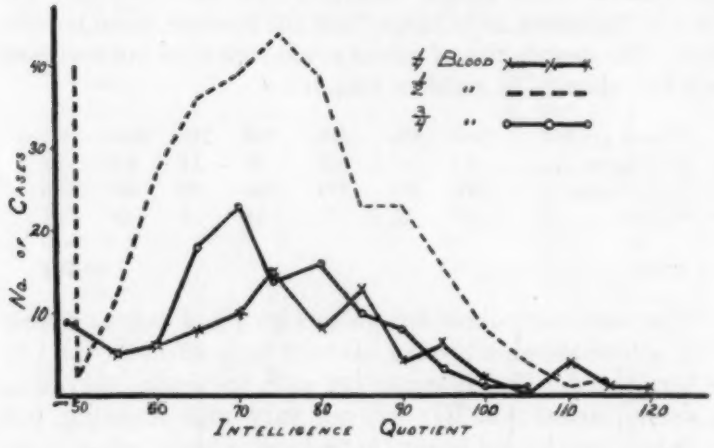

FIG. 1

distributions of the several groups are found to overlap (as measured by per cent attaining and exceeding the median 68.3 of the full bloods) respectively 69, 76 and 80 per cent. This gives some idea of the advantage a quarter blood or a half-breed, or a three-quarters blood individual has over a full blood Indian in N.I.T.-IQ. However, the distribution tables and the graphs representing same do not indicate multimodality excepting in the case of one-fourth bloods where because of the small number of cases the evidence may not be said to be conclusive for believing that the cause is due to blood mixture.

In all of the foregoing observations we are of course leaving out of consideration the undetermined IQ's.

It is interesting to note that scarcely 2 per cent of the three-quarter bloods, a little over 5 per cent of the half-breeds and a little more than 8 per cent of the quarter-bloods attained and exceeded the White norm of 100 IQ. All this goes to show that while the groups as measured are different still the IQ shows no gaps in its distribution—excepting in the indicated $\frac{1}{4}$ bloods where the group is too small to make the results conclusive and consequently from the standpoint of intelligence, Indians and Whites are shown to be still of the same "species" varying around different central tendencies. When the germs of the two races are mixed equally, as in the case of half-bloods, the central measure moves down the scale more toward the measure of the full blood Indian. The more Indian blood the more, roughly speaking, the central measure tends toward the low end of the scale.

We see now from the foregoing that the results indicate that the IQ decreases, roughly speaking, with degree of Indian blood. It remains now to determine just what the correspondence between N.I.T.-IQ and degree of white blood in an Indian is, or vice versa.

Entering into the measurement of the intelligence of this group of 702 children we have these factors: N.I.T.-IQ, degree of Indian blood running from full blood at one end of the scale by a gradual admixture of white blood until we have no Indian blood at the other end of the scale, and school grade. We wish to find the influence of white blood on the IQ regardless of education. We have here three variables (1) N.I.T.-IQ, (2) degree of blood, (3) school grade.

While the method of handling the data will be that of partial correlation using all the cases for which IQ's could be obtained, i.e., 702, we wish to approach the solution of the problem by beginning with correlations in the small, or educational groups.

We first find the correlations between IQ and Degree for

the fourth, fifth, sixth, seventh and eighth grades. Because the third grade group was so small being only 32 cases, it is not considered here. These correlations are:

Grade.....	4th	5th	6th	7th	8th
Number of cases.....	134	169	180	112	75
r.....	+0.70	+0.76	+0.22	+0.23	+0.24
P.E.....	0.04	0.024	0.06	0.06	0.06

It is a singular fact that the effect of degree of white blood in mixed blood Indians should be so great in the 4th and 5th grades and so slight in the sixth, seventh and eighth grades. Whatever influence there is here seems to have reached its maximum in the fifth grade and to have settled down to an evenly operating one in the last three grades.

We now present the correlation between IQ and school grade for a separate degree group, as I (Full and $\frac{7}{8}$ Bloods) II ($\frac{3}{4}$–$\frac{5}{8}$) III ($\frac{1}{2}$–$\frac{5}{16}$). IV ($\frac{1}{4}$–$\frac{1}{16}$)

Degree group.....	I	II	III	IV
Number of cases.....	825*	125	320	91
r.....	+0.25	+0.026	+0.039	−0.03
P.E.....	0.02	0.06	0.04	0.07

* This coefficient of correlation for N.I.T.–IQ and Education in the case of full bloods is reported in Ibid. 3.

These correlations indicate that education as indicated by school grade has little or no effect on the IQ within a degree group. The influence is greatest for the full blood group but not here very significant. It remains to put the data to the crucial test of partialing out the factor of education for the whole group of 702.

We obtain the correlation for IQ and Degree here called r 12, the correlation for IQ and school grade called here r 13 and the correlation for degree of blood and school grade, called here r 23.

The coefficient for the partial correlation in which we hold school grade constant is written r 12.3. The value of r 12 is found to be +0.38. The value of r 13 is found to be +0.006; the value of r 23 is found to be −0.41. R 12.3 is then found

to be +0.42; r 13.2 is then found to be +0.18; r 23.1 is then found to be −0.45.

Then the influence of degree of Indian blood on N.I.T.-IQ when education is held constant is found to be +0.42. School grade has but slight effect on IQ when we hold degree constant. When IQ is held constant the Indians of greatest degree tend to show more schooling.

SUMMARY

1. This study presents evidence which tends to support the belief that intelligence as measured is not peculiar to any special race but is a variable factor in all races. There are no racial types in intelligence.

2. While degree of White blood tends to improve the intelligence, being positively correlated with it (+0.42), it is no guarantee of intelligence for the correlation coefficient is not very high.

3. The IQ of $\frac{3}{4}$ Bloods is 0.74, of $\frac{1}{2}$ Bloods is 75.3, and of $\frac{1}{4}$ Bloods is 77.5. However, these measures are rather high in variability.

4. School education has only slight effect on intelligence as measured by the N.I.T.-IQ. It is more influenced by degree of white blood.

5. Degree of white blood is more influential in lower school grades than in higher ones reaching its highest influence in the fifth grade. In the sixth, seventh and eighth grades it tends to be a constant factor but not a very strong one.

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TRUANCY AND DELINQUENCY

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I. TRUANCY AS DELINQUENCY

A. History of truancy

Truancy is probably one of our age-old problems. There is not much doubt but that from the time of ancient Greece up to the present boys were tempted by the balmy air of spring and the attraction of the out-of-doors to leave the confines of the schoolroom for the more pleasant occupation of rambling around through the fields and woods; but this group is not particularly interested in the ancient history of truancy so I will pass to modern truancy.

B. Modern truancy and what it means

During the early colonial times in this country the school attendance was pretty largely voluntary even after the establishment of free schools. With the advent of compulsory education, about the latter part of the nineteenth century, the problem of non-attendance became more serious. It was felt that education was the one safeguard which the State could use and education was made compulsory upon children within certain age limits. This being true, absence from school interfered with the development of proper educational safeguards in the individual and consequently weakened the State. Washington emphasized the fact that in a nation whose government for its proper development depended upon public opinon, it was absolutely essential that this public opinion be enlightened and education was taken to be the chief source of such enlightenment. Absence from school, then, on the part of individuals endangers the future welfare of the State. In view of this it

was thought necessary to provide certain penalties for absentees. This is especially true for the wilfully absent. Truancy has been defined as absence from school without the knowledge and consent of the parents. So defined truancy is really a very small problem. In my discussion I shall deal with non-attendance in a slightly more general way, not including however, absences due to legitimate causes like illness, death in the family, or other generally accepted excuses. To show how few absences can be classified under the heading of truancy as defined above, let me give you statistics from a survey of absences in Chicago public schools where approximately 5 per cent of the absences were cases of truancy. Truancy was almost exclusively a boy problem as the girls did not seem to be implicated to any extent.

Before America became predominately urban truancy was not so serious. As a matter of fact, in those days the truant, for the most part, engaged in hunting and fishing or wandering through the fields sometimes alone, sometimes in company with another boy. His out of school time was spent in a comparatively wholesome and healthy manner. Modern truancy, especially in urban centers of population is something entirely different from this. The boys who play truant spend their time wandering around the city streets, collecting junk—not always with the owner's consent—frequenting vacant buildings where they shoot craps and gamble in other ways for money, or they sell papers on the downtown streets and go to lurid movies of an undesirable type.

Dodging truant officers they come in contact with boys and men who are dodging other officers. From these they learn various tricks of the criminal profession or come under the influence of anti-social and lawless people. They are subjected to many temptations while out of school. This makes truancy all the more serious.

C. When truancy becomes delinquency

I have sometimes wondered whether truancy should ever be considered a delinquency and subject to a court hearing.

Truancy is really a school problem and should be handled by school authorities. Later on in my paper I expect to bring out certain facts to show why this is true and why truants should never be brought before the court except on the basis of a thorough study of the case from which it has been decided that institutional care, as for example, the feebleminded institution, is the only way in which the case can be handled.

At the present time occasional truancy is not considered such a serious matter and just when or after how many absences a child should be studied carefully to determine the cause of his truancy is a question. From our experience with truants it seems that a truant should, on the very first occasion, be pretty carefully examined to determine why he was absent. So often this first absence is a symptom of a very serious condition either in the home, in the boy, or in the school. If a case is allowed to run on for sometime, too often indelible impressions are made on the boy. His attitude toward school, toward home, and toward authority is entirely changed. He acquires habits of a sort which are nearly impossible to break, and when he is studied some months or years later he is not in condition to yield readily to treatment.

II. RELATION OF TRUANCY TO OTHER DELINQUENCY

A. Proportion of truancy cases becoming Boys' Industrial School subjects

Mention has been made above of the temptations and dangers to which a truant is subjected in the modern city. It is not surprising in view of these facts to find that quite a large number of truants ultimately drift into other forms of delinquency. In our study of boys committed to the Boys' Industrial School from Toledo during the period between 1918–1925 there seemed to be a very definite relation between truancy and other delinquency. It was an element in 40 per cent of Boys' Industrial School cases and in 71 per cent of the Boys' Industrial School cases in which truancy was an element it preceded other forms of delinquency. Thirteen and three-tenths per cent of

the individuals charged with truancy were ultimately sentenced to Lancaster. These facts would seem to emphasize the importance of studying the truant in the very beginning to determine whether or not something could be done to aid in his adjustment.

It may be of interest to this group to analyze briefly the age at which most of our truants are brought into court. Taking the total number of truancy cases 1918–1924 inclusive, we have six hundred sixty-two cases of boys and three hundred five girls. The boys were truant most frequently at thirteen years of age. This means that more boys came in at thirteen than at any other age. Fifteen is the next most frequent age. In the case of girls the most frequent age is fifteen with fourteen only slightly below in frequency of occurrence. It is rather interesting to notice the difference in frequency at different ages between 1918 and the present time. The age of truancy has been rising in the case of both boys and girls. In 1918 twelve was the most frequent age for boys and thirteen for girls. By 1920 the age had jumped, in the case of boys and girls, to fourteen. In 1922 the most frequent age was fifteen for boys and fifteen for girls. In 1924 the most frequent age for boys was sixteen and for girls sixteen.

It is interesting to note that the percentage of truants who are sixteen years of age or over, is steadily rising with the most marked increase during the last year. Prior to 1922 the percentage of truants sixteen or over, that is, within the continuation school limits never reached over 10 per cent. Beginning in 1922 the boys of continuation school age jumped to 26 per cent of the total truancy. In 1924 48 per cent of all boys brought before the court on the charge of truancy were sixteen or over. Approximately the same thing holds true for the girls. Prior to 1922 the highest percentage of truants sixteen or over jumped to twenty-four. In 1922 the percentage of girl truants sixteen or over jumped to twenty-four. This has been rising since that time until last year when the percentage was thirty-three. It has generally been thought that truancy among the older boys and girls is pretty largely a matter of

the children of recent immigrants wishing to go to work. Our records do not show that there is any truth in the assumption. The percentage of truants sixteen or over out in the foreign districts of the city is no greater than in other districts in which very few recent immigrants reside. This is true in the case of girls and boys.

III. WHY THE TRUANT?

A. Defective home conditions responsible

When we come to the consideration of the cause of truancy we find that it may be caused by a number of different factors in the total situation. It can seldom, if ever, be traced to one single cause. Truancy may be misplaced virtue. It may occur in obedience to a selfish, distrustful, lazy or avaricious parent. I have seen children in court for having obeyed their parents. I have even seen them committed to an institution for this obedience. It seems that we are emphasizing the wrong end of the treatment when we force children to disrespect the commands of the parents. I mean by this that the parents are the ones to be brought into court and made to understand that it is to the best interest of their children for them to be properly educated. It is also to their best interest to comply with the law requiring compulsory attendance. I for one do not believe that a child should ever be punished for obeying his parents, rather should the parent be made to suffer the penalty for the misdeed. When the parent deliberately causes the child to absent himself from school the contributing law should be called into effect and the offending parent properly impressed with his responsibility in the matter.

It is not even necessary for the child to appear in court when the parents are responsible for the child's failure to attend school. Personally I doubt if we ever get really satisfactory results from the appearance of the child in court for truancy. It would certainly be very much better to determine, by careful study, the cause of the truancy and remedy the difficulty, be it whatever it may, without subjecting the child to a court appearance. The child is very much more impressed by his

anticipation of the seriousness of a court appearance than he is by the real thing. In addition to the factors of obedience to parents causing truancy, there are a number of other defective home conditions which may bring about the same result. Quarreling and other irritative conditions in the home are carried over to the school attitude, and often cause the child to absent himself from school. The child subjected to constant quarreling and bickering becomes indifferent toward school and ultimately stays away. Sometimes there is a transfer of antagonism toward one member of the family to the teacher and the child stays away on that account. Alcoholism in the parents makes for indifference toward school and frequently causes the child to stay away from school. Poverty has been known for a long time as one of the causes of school absence. The struggle for existence in these cases being so strenuous that school goals and aims are overshadowed by the need for getting sufficient food and clothing, etc. Lack of home control through ignorance of what the school stands for and of the opportunities for self improvement in the school may cause non-attendance. Mother working away from home and failing to get the child ready for school, in many cases, causes the child to be absent. Excessive parental neglect due to other interests on the part of the parents with its consequent failure to stress regular school attendance leads to non-attendance. With a broken family regular attendance in school is the exception rather than the rule and the school has to be very interesting to the child and meet his needs in a very wholesome manner to prevent his non-attendance. Of course, children with no home, who are thrown on the street and exist by their wits have little encouragement to attend school. Children changed about in institutions and boarding homes have no consistent and enduring encouragement to remain in school and consequently yield to the more attractive influences of the street and thus fail to keep up in their attendance record.

B. Defective physical condition

Truancy may be a biological protest against bad air, physical defects, etc. In six hundred twenty cases of truancy in boys brought in in 1923 to the Los Angeles Detention Home, all but sixty were in need of medical attention. The habitual truant, contrary to the popular view that he is a boy who has too much vitality, is freckle-faced and barefooted, is shown by actual study to be under more than the usual number of physical handicaps. This brings up the question of medical examination for truants. In my opinion every chronic truant should receive a thorough medical examination to determine if his truancy is based upon some physical defect in need of immediate attention. This should be given prior to any drastic action on the part of the school authorities. Very excessive over-development for the individual's age is frequently a cause of truancy. The boy is very much larger than the other children of his age and grade. He may associate with boys of his own size who are either out of school or several grades in advance of himself. This inevitably leads to dissatisfaction with the school environment. This brings to my mind a case which we had sometime ago of a boy fourteen years of age who was six feet in height and weighed 150 pounds. Attempts to force this boy to attend the grade suitable to his age development led, in every case, to his running away from home and obtaining employment in some other locality. One time we would hear from him as driving a four-mule team up in Nebraska and another time he would be in Florida or some other state. As soon as school was out he returned home and settled down to regular employment but with the first appearance of the attendance officer he would leave again. This boy had no difficulty in passing for nineteen years of age and obtaining employment and making his own way in the world. It was too much to expect him to settle down to work in the grade with children not yet out of knee trousers. It will be surprising if this boy is not driven into some delinquency by insistence upon his attending school, especially in view of the fact that he had no inclination for academic work.

Premature puberty with its consequent instability often leads to non-attendance developing into chronic truancy. Excessively poor general development with its resulting lack of vitality and general feeling of inferiority causes the boy to avoid the onerous and sometimes too heavy work of the regular grade. This is true also in the case of those with very poor nutrition. Where puberty is very much delayed we get somewhat the same results because the child is laboring under a feeling of inferiority which makes the school unbearable. A large number of our truants are suffering from heart disease, excessive enlargement of the thyroid glands, diseases or defects in the nose and throat, excessively carious teeth, marked defect of vision and hearing, local irritative conditions of the genitals. Some are suffering from defective control of the bladder, stammering, headaches, ring worm, tuberculosis and all of these inevitably react upon the boy and make for non-attendance.

C. Mental abnormalities and peculiar mental characteristics

The above are also frequent causes of truancy. Probably chief among these is poor mental ability, which ranges from feeblemindedness to the merely backward. It is quite easy to see why a person unable to do the work of a grade inevitably tends to avoid the constant irritation caused by this inability in the classroom. Just recently I have had a number of cases of boys who were classified as being in the sixth grade but who had the ability to do only second or third grade work. They had no understanding at all of what the teacher was talking about in the class and the class work was about as interesting to them as a Chinese alphabet would be to us. These boys knew that they were getting absolutely nothing of value from their attendance at school and constant pressure was being brought to bear to force them to do things which were absolutely beyond their capacity. Truancy in these cases was a healthy reaction on the part of these boys. For this they were punished but naturally without resulting in improvement. In our experience only a few cases of the more definitely aberrational psychotic types which are closely allied to insanity have been discovered, so I will not dwell on these.

Other peculiar mental characteristics which often lead to truancy are extreme social suggestibility. By this I mean the individual who succumbs to the slightest suggestion, particularly where this meets his other needs, some of which have been outlined above.

Sometimes truancy is caused by extreme love of adventure which makes it impossible for the individual to settle himself to the drab and sometimes monotonous tasks of the school. Often truancy is caused by a condition almost approaching negativism, that is, the stubborn, contrary individual. This in turn can usually be traced to early childish experiences and the attitude of one or both parents. We have had a few cases of boys who were hypersensitive. The slightest criticism in the schoolroom was taken to mean a personal affront and the individual would undergo almost any amount of punishment rather than subject himself to further criticism of that kind. One particular case of this sort I will describe briefly. The boy was a very sensitive individual, who felt very keenly the inability of the mother and the unwillingness of the father to buy for him necessary books for his high school course. When the instructor in his botany class, for example, reprimanded him rather severely for not having purchased a particular book his reaction to that was to remain away from that class; this in spite of frequent periods of detention in the Juvenile Detention Home and other punishments that were inflicted upon him. This boy was really superior in native endowment and could have done the work very satisfactorily. There were other elements in this case, as in practically every case of truancy, but this was one of the outstanding causes of his delinquency.

We have had a number of cases of truancy in which mental conflict centering around sex matters or parentage or some organic difficulty have caused the child to stay away from school.

D. Defective or unsatisfied interest due to a restricted course of study

Mention has already been made of the cases where little or no inclination or ability for academic work lead to truancy. Take for example a boy who has an academic ability of nine years but whose mechanical aptitude surpasses that of boys several years older than himself. Assume that no provision is made for the exercising and development of this mechanical aptitude. How is he going to satisfy his interest in this field? Since he cannot get it in the school he will be tempted to go outside and spend his time around machinery of one sort or another or building things for his own satisfaction. Quite a large number of our truants fall under this classification.

E. Companions

A large amount of truancy is due, of course, to the influence of bad companions. In a good many of these cases extreme social suggestibility is present. The boy is easily influenced, especially by suggestions that fall in with his dislike for the work offered in the school.

IV. WHAT CAN BE DONE ABOUT TRUANCY

Here as in the field of medicine, prevention is very much more desirable than remedial work. From our discussion of causes, we can point out a few of the general measures that should be taken to prevent truancy. Why is it that some schools have practically no truancy while other schools in the same districts or similar districts, are very much burdened by the volume of non-attendance? Sometimes it is due to the personality of an exceptional principal who attempts to make provision for individual differences and keep the boy interested in school and the school interested in the boy. It may be a question of providing more practical work along the line of the individual's interest; it may be a question of developing a school spirit which does not condone or tolerate absence from school; sometimes it is a question of making the

proper contacts with the home and enlisting the coöperation of the parents. In view of the fact that so much non-attendance is due to failure to provide manual or other practical work suited to the capacities of the boys and girls, one of the first steps in prevention should be a more adequate provision for individual differences in this respect. This would, in my opinion, materially decrease the present volume of non-attendance.

The present tendency toward the visiting teachers or school counselors is a movement designed to bring school and home into closer relationship and smooth out the obstacles to regular school attendance. In the cities in which this has been tried, material decrease in the truancy problem has been the result. We are trying this in a small way in Toledo this year. The visiting teacher is in close contact with the home and is able to keep the teachers informed of difficulties in the home environment which are influencing the child.

Our medical inspection program is designed to detect the presence of physical abnormality and remedy them before they become acute. In this way the amount of truancy caused by such conditions will be very materially decreased.

Absence due to mental abnormalities and peculiar mental characteristics has, in many cases, been foreseen by teachers on the outlook for symptoms of such conditions. If she would take the time to go into the problem with the boy or girl in many cases a satisfactory solution could be reached and the career of truancy prevented. It seems to me that this should be just as much one of the functions of the teacher as the instilling of so many pages of book knowledge about some abstract matter which may only remotely concern the child. In the larger cities courses in the mental hygiene of the school child should be offered to the teachers, the aim being to enable them to detect symptoms of mental maladjustment so that the individuals so afflicted might be referred to the proper experts for analysis and help.

Where truancy has already developed, I want to stress this fact, that the first step, before any treatment of the case is

begun, should be the determination of the causes of the truancy. This cannot be done by a casual conversation with the truant, nor with the parents but requires an analysis of the total situation and of the responses of the individual. In few, if any of the cases, will only one cause be found. In nearly every case it is a complex affair, many of the elements described above entering into the reaction of the individual. In so many cases in our experience, treatment has been accorded on the basis of some one's preconceived notion of why the child was absent. Truant officers have a tendency to consider their case as falling into two or three different categories. I have heard truant officers preface their remarks about a case by telling the Judge that "this is a bad boy and he just won't go to school and that is all there is to it." Examination of these cases have shown the multiplicity of causes which I have described above. It is very important to avoid the penal point of view. The way the first truancy is handled in many cases determines the future attitude of the child toward truancy. A hardness in attitude in many cases has ruined the boy or girl. I have known boys who, in a real effort to live up to the reputation given them by a truant officer, have endured unbelievable suffering and privations. We all crave distinction and the child who is held up by the truant officer as the worst boy in the neighborhood has arrived at distinction of a sort. He thereby becomes the envy of other more fearful boys who follow out his orders. Truant officers as a rule do not realize how great an influence they exert over the future of their cases. Every word they utter makes its impression upon the boy.

As I mentioned at the outset, to my way of thinking truancy is, or should be a school problem and the child should not be brought into Juvenile Court unless for the purpose of commitment to some institution and then not for truancy alone. A child able to adjust himself to the community in every other respect except in his attendance at school, does not promise to become such a menace. In practically every case after provisions are made for his needs, it is unnecessary to bring him into

court. This cannot be said, however, of the parents of many children who, by their attitude or overt acts, contribute to his truancy.

In closing let me say that my chief purpose in this paper has been to emphasize the fact that children act as they act not because of innate badness but because of the total influence of their environment upon the particular heredity which they may have. This means that truancy is not a simple affair to be solved by locking the boy up in the Detention Home or the County Jail or hailing him into court, but requires for its solution an analysis of the more fundamental relationships and ideals of the community.

CHANGE OF ENVIRONMENT AND THE I.Q.

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In view of the necessity of our securing all available information in regard to the nature of intelligence, the validity of our attempts to measure it, and the possibility of our modifying it through environment the following data are submitted. The two cases described below appear to have some value in the light of the above questions for the following reasons: First, because they represent a first measure of intelligence under conditions which it would be difficult to make any worse as regards social and physical features; secondly, because they represent several subsequent measures of intelligence under ideal social and physical conditions; and thirdly, because in September, 1922, another writer in these columns made some predictions in regard to the future of these same children on the basis of their first examination.[1] It is now possible with the aid of the results of four subsequent examinations and a lapse of over five years to check up somewhat on earlier judgments.

In August, 1920, the present writer was called upon to examine Grace and Lulu (fictitious names) for the purpose of determining their fitness for admission to Mooseheart. Mooseheart is a home and school at Mooseheart, Illinois, maintained by the Loyal Order of Moose for the children of deceased members of the lodge. Up to the present, the school is not equipped to care for or to teach feeble-minded children and for that reason all children applying for admission are examined by a psychologist if at all possible.

Before giving any of the quantitative psychological data on

[1] W. T. Root. The intelligence quotient from two viewpoints. Jour. Appl. Psy., September, 1922, vol. vi, 267–275.

these two cases it will be well to consider the social and physical conditions maintaining at the time of the first examination. The older girl was the fifth and the younger the seventh out of 8 births in the family. The father and mother were dead at the time the children were first seen and the children had been living for some time with their aged grandparents. A few months prior to their examination the grandmother had also died. The children had stayed on with the old grandfather until conditions became so bad that neighbors reported the case to the Moose Lodge to which the father had belonged. Little is known of the children before that time except that they had gone to school very little and in recent years, at least, had gone only during the few months in the year when very meagre outer clothing and unshod feet would permit. When a representative of the lodge visited the home to take the children away he found the grandfather very loath to give the children up in spite of the fact that on that day the meals had consisted entirely of pieces of bread broken off the loaf and dipped into bacon fat. The furniture consisted mostly of store boxes and dirt prevailed. It was found necessary to employ the services of a constable in order to get the children away from the grandfather. This was only one of the legal steps involved before the custody of the children was finally placed in the hands of the officials of Mooseheart.

As an indication of the lack of physical attention received by the children the following incident is enlightening. The younger girl is a twin, and early in the spring of the year 1920 the twin brother had either fallen from a horse or had been kicked by a horse with the result that his hip had been dislocated. In August the dislocation had not yet been reduced nor had any medical aid been secured. In the meantime the boy had been going around all the time and had never been kept in bed. Just about this time, however, arrangements were made for his removal to a state sanitarium since a tubercular infection had developed in the joint. At the present time the boy is still in the sanitarium, hence he has never been seen or examined by the writer.

At the time of the first examination in August the three children had been put by the local lodge under the care of a woman on a farm. The humane society had sent some clothes for the children since they had nothing but outer garments—no underclothing or shoes, and the lodge had also given the care-taker money with which to purchase more clothing. When this woman received the children their heads were a mass of sores resulting from vermin but that condition was practically obliterated by August. Otherwise the girls seemed to be in fairly good physical condition. Other details of their rather hectic life in the next few months are perhaps not necessary to establish the points involved in the present argument.

One other group of data, however, is significant both in establishing the social history of the children and also in showing the difficulties of rendering a diagnosis of their mental capacity on first examination. The reference is to the difficulty of ever determining exactly the ages of the two children. In the case of the older one, at least, the age first given was in excess of what now appears to be her correct age and this, of course, lowered her obtained IQ. Various attempts have been made in the meantime to ascertain the correct birth dates for the girls by writing to older members of their family; by consulting lodge records; by writing to the county superintendent of schools, to the state department of public instruction and to the state department of health. The children themselves have never been sure of their ages. In the reports that follow, the birth date used for each is that obtained from what seem to be the most reliable of the sources mentioned above since the records, when obtainable at all, do not agree. Incidentally, of course, the failure to register births either in family records or in municipal documents is one index of social intelligence considering the fact that these births both occurred in a state that has been requiring the keeping of such vital statistics for many years.

At the time of the first examination the girls reminded one of nothing so much as little hunted and haunted rabbits. Their reactions were those of children who have never had any social

contacts and they were at a loss to know how to respond to other human beings in the least strange to them. In response to the question "What's the thing to do if it is raining when you start to school?" both children replied "take *the* umbrell." (They were examined separately and privately, of course.) Verbal peculiarities marked many of their responses and all tests depending upon linguistic ability or upon any modicum of school training were failed.

According to the birth dates since settled upon, Grace's IQ on the first examination was 73 and Lulu's was 77. As remarked before the IQ's as figured at that time were lower, particularly Grace's since the age was thought to be higher. Here was a difficult matter to decide. Even considering the IQ's at the above figures the children at best were borderline and maybe even feeble-minded, providing, of course that the terrific conditions under which they had lived might not have actually lowered their IQ. In those days Mooseheart did not have the provisions which it now has for giving aid to children who can not be admitted to the school and if they were diagnosed as "feeble-minded" they would not be admitted to Mooseheart. In such an event the children would probably be sent to some state or county institution or they would be allowed to remain with the woman who then had them and who had already adopted one other boy. The woman was not a person calculated to arrange an environment that would allow any IQ to operate at its own maximum. Under the circumstances it seemed best to give a very frank statement of the case to Superintendent Adams of Mooseheart and to ask him to give the children the benefit of at least one year at Mooseheart. This was agreed upon.

And now in order to see the other side of the picture and in order to appreciate the environment into which the children went when they were admitted to Mooseheart on November 17, 1920, the following facts are significant. Mooseheart has all of the advantages of the most scientifically and sympathetically managed institution and few of the faults of the ordinary institution. In fact, perhaps, the most conspicuous character-

istic of the place is that it is so utterly lacking in any signs of institutionalism. The philosophy of the superintendent is to give to the children "the best that they could get in any private home." The children live in small groups in cottages and mingle freely with the children in their own and other cottages. There are approximately 100 mothers (*actual*, not institutional) on the grounds to help care for the children aside from numerous other attendants and a faculty of about 80. The meals are arranged by a trained dietitian and expert medical care is exercised at all times. The moral, social, academic and even economic training given at Mooseheart, in the opinion of the writer, can not be excelled anywhere in this country and particularly for just such cases as those under consideration.

About the time of the admission of the children to Mooseheart another member of the psychological staff to which the present writer belongs looked over the records of the cases and in writing up the article for this JOURNAL already referred to made the following statement in regard to Grace, the older girl:[2]

> May it not be true that the monstrous conditions under which the child has lived have markedly deflated her IQ? Is it not possible that if the institution in which she is placed offers her even median social milieu that the IQ may rise appreciably? The writer would venture the prediction that the subject may attain an adult intelligence of low normal (IQ 85 or 90).

Data are now at hand for checking up on this prediction and for determining somewhat accurately just what a marked change of environment has done for these two children. It should be remarked that all of the tests were administered by the writer. (See table 1.)

The above figures speak for themselves and reveal at least three facts rather definitely. (1) The IQ's obtained for each child have remained unusually stable despite change of environment, the average deviation for Grace being 1.68 and for Lulu 1.92. One is led to think that the obtained IQ's

[2] Op. cit., page 271.

are a function of native intelligence much more than of environment. (2) In general, and omitting certain exceptions to be noted later, the effect of change of environment seems to wear off as time goes on. In terms of the accompanying chart, an increase of M.A. of 1 year and 4 months occurring in

TABLE 1

	C.A.	M.A.	I.Q.	BASAL YEAR	RANGE OF YEARS	BETWEEN TESTS	CHANGE IN M.A.	RELATION OF COLUMN 8 TO COLUMN 7
Grace								
								per cent
August 7, 1920	11–5	8–4	73	7	3			
December 3, 1921	12–9	9–6	75	9	1	1–4	1–2	88
September 15, 1923	14–6	10–10	75	9	5	1–9	1–4	76
April 6, 1925	16–1	11–7	72*	10	6	1–7	0–9	47
September 13, 1925	16–6	12–10	78*	8	6	0–5	1–3	300
Aver. Dev. I.Q.								1.68
Lulu								
August 7, 1920	8–5	6–6	77	4, 6	3			
December 2, 1921	9–9	7–4	75	7	1	1–4	1–4	100
August 26, 1923	11–5	8–2	72	7	2	1–9	1–8	95
April 5, 1925	13–1	9–4	71	9	1	1–7	0–8	42
September 13, 1925	13–6	9–11	73	9	3	0–5	0–5	100
Aver. Dev. I.Q.								1.92

* The actual age was used as the divisor in finding the I.Q. instead of the traditional maximum divisor of 16, since recent findings point to the fact that intelligence does not reach its maximum quantitative development until past 16.

an interval of 1 year and 4 months between tests represents 100 per cent or normal growth. The figures show that the children seem to gain relatively more soon after admission to the school than they do later. In both cases the last test seems to indicate another acceleration but since this test was ad-

ministered only 5 months later than the one preceding there may well be a practice effect to account for this probably spurious gain. In the case of Grace, it is interesting to note also that on this last test her basal year is actually lower than it was on the previous test. However, on the last test she managed to pass the paper-folding, the clock-hands reversed, and the enclosed-boxes tests on all of which she had had some successes on the previous examination but not sufficient to score any one of these tests *plus*. These three tests alone, and all depending upon ability to handle visual images, add nineteen months to her mental age. (3) Both children are probably definitely high grade feeble-minded. Their first examination, under poor social conditions, might have been taken at its face value to a greater extent than was done.

It is only fair, of course, to present facts on the other side of the story in order to show what change of environment *has* done for these children. (1) Their social reactions are so different now that it is hard to imagine they are the children seen in August, 1920. When the examiner met them at Mooseheart in December, 1921, they came toward her, extended their hands in greeting and the older one invited the examiner to have dinner in her cottage. (2) Both children were fitted with glasses which they needed. Their weight and general physical condition have been looked after meticulously and they are in much better physical condition than they would probably have been had they not been removed to the school. (3) Both children are being educated to the limits of their ability and each will learn a suitable trade. The older girl is anxious to learn dressmaking and is already progressing in that work. In view of her rather unusual ability in handling visual images she gives some promise of being able to execute in these lines, if not to originate. School progress has been about what one would expect from this type of intelligence. (4) Unfortunately at the time of the last examination unfavorable conduct reports were coming in for Lulu. In fact she was at that time detained in a "discipline cottage" which is one of the last measures taken in the school.

SUMMARY

By way of conclusion it may be said that the improvement in moral, physical, and domestic habits and skills seems to justify the move that was inaugurated for these two children. Their quality of intelligence, however, has remained unchanged during six years. They were feeble-minded in the old environment and they are feeble-minded in the new environment. Finally it may be said that their old environment is probably only an index of the intelligence of the stock from which the children come.

THE THORNDIKE INTELLIGENCE TESTS AND ACADEMIC GRADES

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INTRODUCTION

The aims of this study are: First, to discover the relation between the performance on the Thorndike Intelligence Examination and the academic grades over an entire college course of four years; and secondly, to attempt, by means of analyses and case studies, to find the conditions of correlation and non-correlation, and to relate the scholarship and test record of these students to their intelligence from other points of view.

The group chosen for this purpose was the class of 1925 of the University of Pittsburgh. One of the main reasons for this choice was that in 1922 Dr. Root (1), in a study of 569 freshmen who took the Thorndike Examination in 1921, correlated their Thorndike ranking with their academic standing for the first semester. The coefficient of correlation obtained by Dr. Root for the first semester was .51. It was in order to follow up his investigation that the present study was undertaken.

To compensate for the variance in distribution of A's, B's, C's, D's, and F's in different courses, so that subjects in which there were very few A's or B's and many F's could be given higher values than subjects in which the contrary condition occurred, it was decided to transmute all grades to sigma values, as was done in the calculation for the first semester. In computing the sigma values for the first two years, little difficulty was met owing to the great number of students taking the same courses. The situation for the last two years, however, was entirely different.

Of the 569 students who took the Thorndike Examination

only 153 were graduated from the University of Pittsburgh in June, 1925. Furthermore, the work of the last two years is scattered over such a wide range of subjects that in over half of the courses the tabulation revealed not more than three or four students to a subject. With such a small number it was obviously impractical to compute sigma values. The sigma values for the rest of the subjects (consisting of courses in the Schools of Engineering, Education, and Business Administration) were computed, but because of the highly selected character of the students they yielded values much lower than those of the first two years, when C's, D's, and F's were more plentiful. On account of these difficulties, it was finally determined to take the grades of the first two years as a sufficient index of a student's academic standing and, where any appreciable change in the grade of academic work during the last two years was noted, to make an analysis of the actual letter grades given.

THE CORRELATION BETWEEN THE THORNDIKE EXAMINATION SCORE AND THE ACADEMIC GRADES FOR TWO YEARS

Coefficient of correlation	0.39
Probable error	0.046
Median of Thorndike grades	73
Range of Thorndike scores	21–98

Tabulation 1 groups the students according to Thorndike's classification, of which Thorndike makes the following statements:

A boy scoring over 95 is worth admitting in almost entire disregard of technical deficiencies.

A boy scoring 85 to 95 has intellect enough to do collegiate and professional work with distinction.

A boy scoring 70 to 85 has intellect enough to do the work to obtain a college degree.

A boy scoring 60 to 70 may be admitted if he is sufficiently in earnest and otherwise desirable.

A boy scoring 50 to 60 should be admitted only if he is of extraordinary zeal or has suffered very great educational handicaps.

A boy scoring under 50 should not be admitted.

The academic grade rank-orders are grouped so as to agree with the Thorndike classification. Groups A, B, C, D, E, and F compose the Thorndike classifications; groups A′, B′, C′, D′, E′, and F′ are the academic grade classes. Thus in the A or A′ group there are 2.6 per cent of all students. In the B or B′ group there are 17 per cent of the students. In the C or C′ group there are 41 per cent of all the students. In the D or D′ group there are 28 per cent of the students. In the E or E′ group are 7 per cent of the students. In the F or F′ group are 3 per cent of the students. The resemblance of this distribution to the normal distribution of grades (A—3.5 per cent, B—24 per cent, C—45 per cent, D—24 per cent, F—3.5 per cent) is noticeable.

TABLE 1

THORNDIKE SCORES	GRADE RANKS						TOTAL
	A′	B′	C′	D′	E′	F′	
A (over 95)	0	0	3	1	0	0	4
B (85–95)	2	11	9	4	0	0	26
C (70–85)	2	9	34	14	2	2	63
D (60–70)	0	4	14	19	5	2	44
E (50–60)	0	2	2	4	3	0	11
F (below 50)	0	0	1	2	1	1	5
Total number of cases							153

Regarding the students as atypical with respect to the correlation who are more than one step (above or below) removed from the precise class in which they would have been placed had there been perfect correlation, we have:

In group A (students scoring over 95 in the Thorndike tests) 100 per cent are atypical, three being the C′ group and one in the D′ group.

In group B (students scoring between 85 and 95) 15 per cent are atypical.

In group C (students scoring between 70 and 85) a chance distribution is approximated.

In group D (students scoring between 60 and 70) 13 per cent are atypical.

In group E (students scoring between 50 and 60) 36 per cent are atypical.

In group F (students scoring below 50) 60 per cent are atypical.

We must remember, however, that differences in the character of scholastic work between students separated only by one step are sufficiently high for purposes of classification into Superior, Very Superior, Average, Inferior, and Very Inferior.

From the above data the following observations are suggested:

I. As a basis for predicting scholarship, groups C, D, and B, respectively, are most likely to agree with actual grades given.

II. Groups E, F, and A are the least valid for the prognosis of scholarship if the Thorndike classification is to be followed.

III. From the data obtained here, it would seem safe to predict that a student scoring over 95 in the Thorndike tests is unlikely to attain more than average academic standing.

Any of the following explanations appears plausible:

1. If the Thorndike tests actually reveal intelligence or scholastic aptitude, then the explanation for the average or low grades received by all of the students scoring over 95 may be that, because of their very superior intelligence, they found school work too easy and uninteresting to act as an incentive for scholarship. Another possibility may be that, although possessing high intelligence, group A did not have proportionately high character qualities necessary for high grades. Still another possibility is that, various environmental causes prevented the students of this group from exerting their greatest efforts. (Why they should affect group A and not the other groups is not clear.)

2. If, however, the Thorndike Examination measures only one aspect of scholastic intelligence, then according to the laws of chance, an extremely high degree of this aspect would in all

probability not be accompanied by a proportionally high degree of the other mental qualities composing scholastic intelligence.

IV. In view of the fact that by far the greatest numer of atypicals are located at the extremes of Thorndike classification: viz., groups A, E, and F; it does not appear feasible to admit those scoring over 95 "in almost entire disregard of technical deficiencies," or to exclude those scoring under 50 or 60.

Because of the small number of cases in the A, E, and F group of this report, it might be thought that the above situation is not representative.

ANALYSIS OF THORNDIKE SCORES OF FIFTY FAILING STUDENTS

An analysis was made of fifty students who failed in their studies the first two years. Of these, twelve, or 24 per cent, scored below 50 in the Thorndike test. Eleven, or 22 per cent, made between 50 and 60. Six, or 12 per cent, made 60 and 70. Eighteen, or 36 per cent, made between 70 and 85. Three, or 6 per cent, made between 85 and 95. None made over 95.

Regarding the distribution of Thorndike grades over the 569 freshmen as the normal one, we have the following:

11.0 per cent score under 50
17.0 per cent score between 50 and 60
25.0 per cent score between 60 and 70
35.0 per cent score between 70 and 85
9.5 per cent score between 85 and 95
1.5 per cent score over 95

Subtracting to find how much better than chance the Thorndike tests are when applied to a special group, we have:

In group F (below 50) there are 13 per cent more than chance would have picked (a correlation of approximately 0.50).

In group E there are 5 per cent more than chance.

In group B chance would have picked 3.6 per cent more than the Thorndike test.

In group C the test gives just about the same result that chance would have given.

From this study the only conclusion that can be drawn is the tendency for students scoring below 50 to drop out, although

there are too many exceptions to warrant excluding all students on this basis. If, however, a student with a score of below 50 has failed to make passing grades the first semester, the probability is very great that he is incapable of doing college work.

INDIVIDUAL ANALYSES OF THORNDIKE TEST SCORES AND ACADEMIC GRADES

Of the nine students who made over 95 in the Thorndike test, four were graduated in June, 1925. The following information was obtained about the five whom we could not follow through for four years:

Case A

Thorndike test score	110
Thorndike rank first semester	1
Grade rank first semester	10

A, recently obtained his Master's degree and ranked among the first in his class.

Case B

Thorndike test score	108
Thorndike rank first semester	2
Grade rank first semester	18

B's grades were uniformly high throughout his college course.

Case C

Thorndike test score	101
Thorndike rank first semester	3
Grade rank first semester	387

C's grades for the first semester were two C's, one B, two F's and one D. His grades for the second semester were even lower. There is no record of C's sophomore year.

Case D

Thorndike test score	99
Thorndike rank first semester	4
Grade rank first semester	46

Case E

Thorndike test score	97
Thorndike rank first semester	8
Grade rank first semester	137

E's grades show a steady decline. In his sophomore year he had one F and one D. There is no record beyond the third semester.

The remaining analyses concern the students in the group of 153 graduates.

Case F

Thorndike test score..... 98
Thorndike rank in group of graduates..... 1
Grade rank first semester in group of 569 students..... 132
Grade rank after two years..... 71
Grades for last two years..... 12 B's, 9 C's, 3 D's

Case G

Thorndike test score..... 97
Thorndike rank in group of graduates..... 2
Grade rank first semester in group of 569 students..... 89
Grade rank after two years..... 67
Grades for last two years..... 6 B's, 9 C's, 1 D
I.Q..... 122
Vocabulary..... Superior

G was graduated from high school among the upper five. There is no indication from his collegiate work that he is a superior student.

Case H

Thorndike test score..... 96
Thorndike rank in group of graduates..... 3
Grade rank first semester in group of 560 students..... 188
Grade rank after two years..... 98
Grades for last two years..... 5 B's, 17 C's, 3 D's, 1 F

H's scholarship is below the median. He belongs in Group D′ notwithstanding the high Thorndike rating.

Case I

Thorndike test score..... 96
Thorndike rank in group of graduates..... 4
Grade rank first semester in group of 569 students..... 115
Grade rank after two years..... 44
Grades for last two years..... 10 A's, 10 B's, 4 C's

I is the only one of the four students in Thorndike group A (those scoring over 95) who shows a tendency to get B′ grades and whose work the last two years is superior to that of his first.

Case J

Thorndike test score..... 95
Thorndike rank in group of graduates..... 5
Grade rank first semester in group of 569 students..... 197
Grade rank after two years..... 116
Grades for last two years..... 5 B's, 12 C's, 2 D's

J is in class D′ for academic grades. Aside from a few B's in his major subject, he shows no sign of superior academic ability. His grade-rank the first semester, moreover, is slightly above the median; whereas his academic rank after two years is below average.

Case K

Thorndike test score	88
Thorndike rank in group of graduates	21
Grade rank first semester	197
Grade rank after two years	184
Grades for last two years	3 A's, 14 B's, 14 C's, 3 D's

K's grades for the first two years place him in class D′. His average for the four years probably raises him to group C′.

Case L

Thorndike test score	67
Thorndike rank in group of graduates	106
Grade rank first semester	128
Grade rank after two years	18
Grades for last two years	10 A's, 10 B's, 4 C's

L's Thorndike score places him in class D. His scholastic average for the four years is sufficient for class B.

Case M

Thorndike test score	61
Thorndike rank in group of graduates	135
Grade rank first semester	122
Grade rank after two years	77
Grades for last two years	3 A's, 9 B's, 6 C's

M was graduated first honor from high school. His performance on the first half of the test is much higher than on the second. This tendency manifests itself in higher grades in mathematics than in language.

Case N

Thorndike test score	50
Thorndike rank in group of graduates	148
Grade rank first semester	350
Grades for last two years	5 B's, 7 C's
Binet IQ	84
Vocabulary	14-year level

In spite of his low score on the Thorndike test and his low IQ, N managed to go through college with practically average grades.

Case O

Thorndike test score	77
Thorndike rank in group of graduates	58
Grade rank first semester	272
Grade rank after two years	76
Grades for last two years	19 A's, 7 B's, 4 C's, 1 D

Nothing in O's first two years of academic work nor in the psychological test can account for the high grades received by O in his major studies during the last two years. For the first two years O's grades were D and F in those very subjects in which he excelled later.

Case P

Thorndike test score	21
Thorndike rank in group of graduates	153
Grade rank first semester	449
Grade rank after two years	142
Grades for last two years	3 B's, 14 C's, 6 D's
Binet IQ	103
Vocabulary	12-year level

This case is interesting because P had the lowest Thorndike score of the 569 freshmen tested in 1921. His IQ, however, shows at least average intelligence. The meagre vocabulary may throw some light on the reasons for his low Thorndike score. It should be noted that, though P is last in rank in the Thorndike test, he is 142nd, or in class E′ in academic standing.

Case Q

Thorndike test score	46
Thorndike rank in group of graduates	151
Grade rank first semester	524
Grade rank after two years	153
Grades for last two years	5 B's, 14 C's
IQ	107
Vocabulary	Average

O's grades show steady improvement. His sigma values for the first four semesters, respectively, are 2.01, 2.15, 2.59, and 2.11. His grades for the first two semesters were D's and several F's. In his sophomore year he received mainly C's. During the last two years his scholastic record was at least as high as that of G, who made 97 on the Thorndike Examination and whose record on the Binet was 122 IQ.

Case R

Thorndike Test score	79
Thorndike rank in group of graduates	49
Grade rank first semester	2

Grade rank after two years	1
Grades for last two years	15 A's, 5 B's

R, with no more than average performance on the Thorndike Examination, maintains a scholastic average sufficient to rank him first in scholarship after two years. His record for the last two years shows no decline.

The above data and the studies of academic grades of the graduates suggest the following observations:

1. There is a tendency for students to maintain the academic rank-order achieved the first semester throughout their college career.

2. There is no evidence that students with a low Thorndike score, whose grades the first semester are average or above, tend to get lower grades during the latter part of their university course.

3. Many students scoring high in the Thorndike tests tend to get lower grades the latter part of their course, especially if their academic work the first semester is average or somewhat below.

RECENT LITERATURE ON THE SUBJECT

In attempting to explain the disparity between the Thorndike score and academic grades, the simplest procedure would be to consider those whose academic record was markedly higher than their Thorndike rating as students possessing superior powers of application and industry, and to look upon those whose scholastic achievement was much lower than would be expected from their Thorndike score as students who were unusually lazy or indifferent, or who were burdened with severe environmental handicaps. This hypothesis has been assumed in most of the recent literature available to the writer.

H. G. Stead (2), after obtaining results of mental, motor, and scholastic tests and character ratings given to 227 children, reaches the following conclusions:

Correlation between scholastic and mental tests	0.57
Correlation between scholastic tests and character ratings	0.335
Correlation between mental tests and character ratings	0.25

The correlation between mental ability and character is due to the correlation of each with scholastic ability.

Intelligence tests may select pupils of two distinct types:

1. Those of high intelligence and high powers of application (plus character factor).

2. Those of high intelligence but of small powers of application (minus character factor).

The author makes no attempt to prove that other factors, in addition to the character factor, do not enter into the problem. Furthermore, conclusions regarding character are drawn from ratings of teachers on such traits as persistence, trustworthiness, conscientiousness, changeability, leadership, and general excellence of character. The writer admits that these ratings are not to be considered as reliable as the mental and scholastic tests.

Othniel R. Chambers (3) has tried to determine "whether college achievement could be foretold on the basis of character traits, and, if so, to what extent; and to determine whether such character trait tests, when used in conjunction with an intelligence test, would materially raise the correlation existing between such intelligence test scores and actual scholastic achievement."

The Pressey X-O Test, Form B, was the character test used with over two hundred students. The following are some of the results:

The X-O test predicted achievement as well as the group intelligence test. The combination of X-O test and intelligence records gave some increase in correlation, but this was comparatively small in predictive value over the intelligence test alone. "The two examinations apparently test similar factors."

This investigation, we see, yields us no positive results.

Miner (4), endeavoring to discover the reasons for "disparity between scholarship and intelligence," tried the Downey Will-temperament Test on thirty-two cases: sixteen "extreme scholarship-lower" and sixteen "extreme scholarship-higher" college students. Dr. Downey's efforts to interpret the will-profiles showed no difference between the two groups. Interviews

with the scholarship-lower group indicated that environmental factors played little part and that lack of interest in college was the principal cause of low scholarship in eleven of twenty-seven cases studied.

In view of the apparent failure, thus far, to find any character quality that distinguishes the superior student with a high intelligence rating from the superior student with an average or low intelligence score, it was thought that perhaps there existed intelligence factors necessary for scholarship which were not being measured in the ordinary psychological tests. At least two theories are applicable here: first, that the intelligence examination tests only initial and not ultimate capacity; second, that the test cannot reach certain intellectual factors of great importance for scholarship.

Mary Kincaid (5), reviewing the experiments on the effect of equal amounts of practice on individual differences, concludes that "there is a tendency for differences to decrease as the result of equal amounts of training for the group." The initial test evidently does not gauge adequately the capacity of many individuals. Miss Kincaid's findings remind us of Dr. Hollingworth's statement (6) of the relation between momentary capacity and ultimate achievement: "In the direct application of mental tests it has too often been assumed that the actual performance of an individual, in one or a dozen trials at a given task, is in some way or other significant of that individual's final capacity in such work."

Tests of what appear to mental processes different from those measured by the ordinary group psychological examinations, were devised by A. Barbara Dale (7). The distinguishing feature of this test, which is designed for children, is that there are no time limits. Miss Dale gives as the reason for the need of such a test that "there is not yet sufficient evidence that many intelligence tests do not make too great a demand on speed of mental reaction and too little on the power of consecutive thought." The test results show no relation between score and speed of working, whereas the common group tests depend, as Peak and Boring (8) have concluded, almost entirely on

speed. The slow workers in Miss Dale's test seem to work to the limit of their ability. From this Miss Dale infers that "in the reasoning process speed seems of secondary importance."

Two of her case studies appear below:

1. Second in group of thirty in the intelligence test (IQ 127)
   Reasoning test tenth in group; reasoning ability average
   Finished fourth in point of time
2. Twelfth in group of thirty in the intelligence test (IQ 86)
   Reasoning test first in group

It might be worth while here to quote a passage from Dr. Stoddard's discussion (9) of the value of learning experiments conducted with the simple material of which psychological tests are usually composed:

> It will not make much difference how excellent his [the student's] memory is, or how perfect in detail his coördinated material, so long as he develops and maintains an appetitive-digestive-productive mental system devoted to the ends set up as the goal of university training. It is important to know the intricacies of his mental-educational relationships, what area he can cover; it is even more important to know the depths of these relationships, how high he can go. It is this hierarchical feature of learning that experiments carried out in linear fashion with simple material completely miss.

CASE STUDIES

The writer has tried to obtain all the available data concerning each individual's habits of study, activities, interests, and attitudes which help to enlighten us as to the reasons for his academic standing. It is believed that the suggestions at the end of each case may be useful in future researches. The cases described are, with one or two exceptions, of students whose academic rank-order is higher than that of their Thorndike score. This condition is due, first, to the accidental circumstance of acquaintanceship, because of which the writer could get very little information about students with a high Thorndike score and a low academic ranking. In the second place, the writer believes that explanations of high scholarship are more conclusive and definite, all things being equal, than

of low scholarship. One instance of this fact is evident in Miner's investigation (4), in which he cites lack of interest in studies as the most popular explanation for the low scholarship of the superior intelligence group. But lack of interest is incapable of being measured objectively, is often given by feeble-minded children as the reason for their backwardness in school, and is such a blanket term that it has little scientific value.

At least four or five of the students analyzed below have been known to the writer more or less intimately from two to six years. The others are acquaintances about whom information has been obtained directly or from their close friends. All of the students have been thoroughly discussed and rated by many within their own circle of associates. The following descriptions are, therefore, to be considered as composite judgments.

Case 1. S's Thorndike score is 58, placing him in class E. He should be admitted, according to Thorndike, "only if he is of extraordinary zeal or has suffered very great educational handicaps." His performance is uniformly low on Part I, Form I; Part I, Form M; Part II, Form D. It was only on the last form that his score reached slightly above the median. In the group of 569 freshmen who took the test he is 405th; he is 140th in the group of 153 graduates.

In academic grades for the first semester S is forty-seventh in a class of 569. He is eighth in rank after two years of college work, advancing him to the top of class B′. S's grades for the first two years show an almost steady improvement. For the first semester the sigma value of his grades is 4.01; in the second semester there is somewhat of a decrease, his sigma value being 3.69. The third semester, however, the value rises to 4.37; and the fourth semester the value is 4.73. According to his grades for the last two years, he belongs to class B′. He had 10 A's, 11 B's during these years.

An interview with S revealed that he had probably done his best in the Thorndike Examination. He believed his performance above average. The value of the test he doubted on account of the great variety of random facts one must know in order to get a high score, and he thought such information accidental to one's environment. The necessity for quick response, he claimed, also made him nervous and hasty in answering.

The great discrepancy between the Thorndike score and his scholastic rank might lead one to conjecture that S's high school training must have been extremely thorough in preparation for collegiate work. The

fact is that S had taken the commercial course in high school—a course usually chosen by students not expecting to enter college.

Inquiries concerning habits of study disclosed that S studied very hard the first year and that the work was exceedingly difficult for him since, aside from taking a full schedule at school, he was doing five to six hours of outside work daily. The remaining years of his college course he found much easier, although he continued his outside work as before and his subjects were, if anything, more difficult.

To acquire a ranking of eighth in a class of 153 selected college students, while doing six hours of concentrated outside work and carrying a full schedule at school, appears to require more than noteworthy powers of application. This case bears witness to the need of studying the factors involved in assimilating academic material.

Case 2. T's Thorndike score is 88, putting him in class B. His performance on the first part of the examination is much higher than on the last. This seems to indicate that T is more likely to be capable of quick reaction in problem situations than in comprehension of difficult reading material and language. T is forty-fourth in rank in the group of 569 freshmen; he is twenty-second in the group of graduates.

In academic grades for the first semester, T is seventeenth in a class of 569. After two years of academic work he is ninth in rank; he is thus in class B′. T's work for the last two years reaches a higher average: 15 A's and 9 B's, probably shifting him to class A′.

The records of T show that he was validictorian of his high school class. He admitted that he studied hard in order to attain an honor ranking in college. The subjects he took, he confessed, ordinarily did not interest him much; his chief aim was to accumulate A's. For the first three years T had participated in practically no school activities. He rarely went out in the evening and did no outside work. During the last year, T joined an activity, in which, according to the opinion of friends and acquaintances, he showed exceptional ability in managing affairs. T is alert, decisive, dynamic, and though not very sympathetic, is as capable of handling social material as he is in dealing with academic, subjects. T's cultural interests are rather narrow and meagre. He shows slight appreciation for music, art, or literature.

For the most part, this case displays a well-rounded personality with superior performance on the psychological test, high academic standing, and unusual executive ability. Evidently, continuous and systematic study plays an important

part in achieving high scholarship, even in cases of uncommon intelligence.

Case 3. The Thorndike score of U is 90. He is sixteenth in rank-order and in class B. There is no marked deviation from the average in any of the four parts of the test.

On the Binet test his IQ is approximately 122 (M.A. 19–6), the limit of the present Stanford-Binet Scale. His vocabulary is Superior Adult.

In academic standing he is seventh in rank the first semester. After two years of college work he progressed to fourth place among 153 students. He is thus in class A′. During the last two years he amassed a total of 21 A's and 6 B's. It is evident that U is definitely in class A′ for his entire college career.

Like case T, he was very studious, engaged in no school activities or outside work, and seldom took part in social affairs. As regards social intelligence, however, there is a pronounced contrast. U manifests no ability to lead or manage people. One is inclined to judge him as below average in social sensitivity; viz., the ability to interpret the motives and attitudes of others. There is a naïvete and lack of social adaptiveness about U, which, though by no means serious, stands in distinct opposition to his undoubted superiority in the psychological test and in scholarship. Whether this inability to handle social material with the degree of intelligence shown in other fields is due to early environment, emotional causes, or innate intellectual factors, it is impossible to say. U's cultural interests, in spite of his liking for academic work, are very limited. He is not widely read beyond the material of his school studies.

The need for tests and methods to estimate objectively the degree of social intelligence possessed by students arises in the study of such cases.

Case 4. The score of V's Thorndike test is 74. Being sixty-seventh in the graduating class, he is in group C. His rating on the first half of the Thorndike tests is a trifle better than on the last half, but none of the test results denote superiority or in any way explain V's scholarship rank.

During the first semester V was ninth in scholastic standing in the freshmen group. After two years his average grade places him fifth, or in group B′. Had he been fourth in rank-order, he would have been in group A′. The grades of the last two years, 12 A's and 11 B's, are probably such as to give him an A′ rank.

The significant feature of this case is that V was one of the most prominent members of his class. He took part in almost

every activity. His duties were incredibly numerous. Notwithstanding all his social obligations, it is clear that V managed to arrange his schedule so systematically that all his leisure could be utilized and sufficient time left for study.

Cases of this type must be investigated from the standpoint of methods, conditions, and regular plan of study.

Case 5. W received 77 in the Thorndike tests. He is sixtieth in the group of graduates, and is, therefore, in class C. His performance on the first half is lower than on the second half of the Thorndike Examination, indicating a greater aptitude for comprehension of reading material than for speedy reaction to test problems.

W was eighty-ninth in academic grades the first semester; his grades show an almost steady forward movement each time. The sigma values for the first four semesters, respectively, are: 3.74, 3.67, 4.04, 4.22. W's rank at the end of the first two years is seventeenth in the graduating class. He is definitely in group B′. His grades for the last two years were even better than those of his first: 15 A's, 5 B's and 3 C's.

W's attitude was skeptical and somewhat contemptuous, but his performance is high enough to convey the impression that he approximated his best efforts.

This student was graduated from high school with high honors, and while there was active in many affairs. At college he applied himself diligently to his school work. Several hours each day he was engaged in some remunerative work; he attended various social functions three or four evenings a week. Generally, he obtained six to eight hours of sleep daily. It is obvious that the amount of time spent by W in study could not have been more than average.

Observation of W's method of study disclosed the following facts: W could retain concepts clearly; he constantly made classifications; he continually compared, contrasted, and associated the elements of the subject matter at hand with each other and with ideas of diverse fields.

Socially, W is highly adaptable. He has had few opportunities to lead, but formed many new acquaintances at college. Among his characteristics are business ability, persuasiveness, and conversational powers. He possesses intellectual interests to some extent, but his aesthetic tastes are restricted.

This case gives us a glimpse into the mental processes concerned with the learning of academic material. Similar to several cases previously cited, it points to the need for further research into the actual workings of the mind while studying.

Case 6. A study of X's case presents this data: His Thorndike score is 79; he is forty-seventh in the graduating class, or in group C. X's showing on the last two tests are decidedly better than on the first.

In scholastic standing X is eighty-third among 569 freshmen. At the end of two years his average places him thirty-first in rank. If he had been thirtieth, he would have been in group B′. X's record for the junior and senior years was such as to give him an average of B. For all practical purposes, he might be considered as belonging in group B′.

X's account of his reaction during the Thorndike Examination helps to explain why he attained a superior ranking in the last half rather than the first. While working on the first two tests, X claims he was nervous, owing to the speed required and to his general attitude toward psychological tests—an attitude of apprehension lest his performance brand him as of inferior mentality. X says also that, in timed tests of any sort, the realization that the time was limited and that hurry was essential, would often act as an inhibition, retarding and occasionally eliminating the proper association of ideas. Even when there were no inhibitions operating, his test grade might still not be above average, X admitted, due to his cautiousness, his tendency to introspect and speculate as to the best methods of attack, or to his moderate reaction time and quickness of association.

X was graduated from high school with honor, ranking eighth in a class of over a hundred. At college his habits of study during the four years had been irregular and spasmodic. For over half of the subjects, X maintains, he spent little time in preparation, except for cramming before monthly or semester examinations. Preparing his lessons for many of the courses consisted simply in half an hour's perusal of the note book or text once or twice a week. In some of the courses he tried to spend the required two hours for every class period, but in no case was this done with any degree of regularity. Besides natural laziness, which X agrees was a cause, he considers that the following conditions and outside interests prevented him from putting more time and effort on his studies.

X worked two to four hours daily at odd jobs throughout his high school and college career. At the university he belonged to two activities. Usually, X went out four or five times a week with companions to the theatre or movies, for walks, or to dances and parties. Included in his intellectual interests are philosophy and literature (outside the field of prescribed text books), which he preferred to read or discuss rather than to prepare his lessons daily.

Here is a student with varied interests and activities as well as superior scholarship. This case suggests the necessity for other criteria in order to supplement the conventional group

intelligence test with its emphasis on speed of reaction. If group tests without time limits could ever be designed for college students, they might be useful in such cases as the above. But as Miss Dale (7) says, "For adults it becomes almost impossible to find material of sufficient complexity which is yet of equal familiarity to each person tested."

Case 7. Y's Thorndike score is 83. He is thirty-fifth in rank—the upper part of class C. His performance is plainly higher in the last form, the comprehension of difficult reading material, in which he is seventh in order in the group of 569 freshmen.

For the first semester, Y is thirty-first among the freshmen in academic grades. His average for the first two years gives him a ranking of third in the class; establishing him in class A′. His grades for the last two years show little if any decline.

Y was graduated with highest honor from high school. In college he was prominent in several activities. Friends and acquaintances agree in their high estimate of Y's intelligence and general capability.

This case may possibly indicate that a very high performance in a single section is evidence of a special ability, resulting in superior achievement in a particular field (the field of language in this instance).

Case 8. The Thorndike test score of Z is 92. Being in the upper division of class B, eleventh in the graduating group, he falls into the classification of which Thorndike says, "has intellect enough to do collegiate and professional work with distinction."

Z's academic grade rank for the first semester was one hundred fifth in the class of 569 freshmen; after two years, his rank was forty-seventh among the 153 graduating students. He is, therefore, in the average group of C′. The college grades for the last two years were 11 A's, 10 B's, and 2 C's. This record is better than his previous one, it was discovered, because he applied himself more in his major subjects.

While at high school he was just an average student. In college there was nothing about Z that placed him far above others socially or intellectually, although he did show some ability to lead. The Thorndike information questions, in which Z rated high, do not seemingly locate students of wide reading but rather those with many incidental facts at their disposal; for Z, in his contacts with his classmates, does not give the impression of culture or scholarship.

This case illustrates the advisability of constructing tests of intensive knowledge of art, music, or branches of literature

and philosophy in order to pick out those students whose reading and experience have been special and thorough instead of extensive and haphazard.

Case 9. A's score of 47 in the Thorndike test places him in group F, the group which Thorndike considers incapable of doing academic work. He is 150th in the class of graduates.

In academic grades, at the end of the first semester, A is 249th among the 569 freshmen; 112th at the end of the first two years, or in D′. But his grades for the last two years were 1 A, 10 B's, 8 C's and 3 D's, which would probably raise his entire standing to C′.

The high school work of A was well above the median of his class. His associates value his opinion, his good common sense, and judgment. They admit that he is not quick or clever, and does not possess a wide range of information, as would be expected from his Thorndike rating. A seems to appreciate art and music. He plays the violin with some degree of skill. Although not a leader, A can easily adapt himself to different situations and people, due to a rare sensitiveness and understanding of human nature.

This is a good example of a type of student, desirable in all respects, who would have been barred had the Thorndike tests been used as the sole criterion for admission to college.

Case 10. Among our case studies, the highest Thorndike score, 95, was attained by B, of whom we have no scholastic record beyond the second year. B lacks one point of being in class A. His rank-order is eleventh in the group of 569 freshmen. B's Binet IQ is about 122 (M.A. 19–6); Vocabulary: Superior Adult.

In academic grades B stands thirty-third at the end of the first semester; the record of his second semester is slightly lower. By the completion of his sophomore year B had received the following grades: 4 B's, 1 C, 4 D's and 1 F. The latter part of his junior year B dropped out of school.

B was a high honor student in high school, where he was known for his studiousness and zeal in learning. He had few social contacts since most of his time was occupied with his lessons. His deficiency in social intelligence is illustrated by the remark of many of his classmates, "He is bright in school, but that's all." One of the reasons for this opinion is B's weak sense of humor. Often his friends would relate to B humorless incidents as if they were jokes in order to watch him break into loud laughter. Much of B's spare money was spent on correspondence school courses in salesmanship, books on palmistry, and lessons in phrenology. He also purchased many useless articles including boxes

of women's hose, beads, and other things which he intended to sell but never did.

As far as could be ascertained the following circumstances played an important part in causing him to drop out of college. Previous to his admission to the university, B had consulted a phrenologist whose advice that he take up medicine made him change his plans to enter the school of engineering. His grades, during the first year, as was stated, agree fairly well with his former school record. The first semester of his sophomore year one notices a distinct change in his academic work; among his grades the D in psychology is the most significant. Reports have it that B argued with his psychology instructor when the subject of phrenology was discussed and was much disturbed when his pet theories were attacked. This experience so discouraged him that even in other subjects his grades were affected. The only F he ever made was in his second semester in psychology.

It is obvious that a complete study of cases of this type would enable one to gain insight into the causes of emotional maladjustments. A thorough psychological and social analysis of such cases would probably prevent many capable students from dropping out of school.

CONCLUSIONS

1. There is a very moderate degree of correlation (0.39) between the Thorndike Examination score and the average academic grade for the first two years.

2. The indications are that the above situation holds true for the average academic grade of the entire four years of the university course.

3. The correlation between the Thorndike score and the average academic grade is too low to justify the exclusion of students from college on the basis of the Thorndike rating alone.

4. A high Thorndike score does not necessarily, nor even usually, imply high scholarship, great social intelligence, or pronounced intellectual interests; nor does an average or low Thorndike score imply average or low scholarship, intellect, or social intelligence.

5. Other intellectual elements, exclusive of those measured by the Thorndike tests, are operating in at least many instances

of superior scholarship. The number of individuals studied intensively is too small to justify generalizations as to the nature of the factors involved, or as to whether they apply in all cases. Extended powers of analysis, classification, and interpretation, are probably among the mental processes included in these intellectual elements.

6. The Thorndike tests, although they do not have high predictive value, are very useful in the study of individual cases since they isolate and measure an aspect of intelligence of considerable importance for scholarship.

7. In order to obtain an adequate intellectual estimate of a student, it is necessary to supplement the Thorndike score with individual tests, questionnaires, and follow-up studies.

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NOTES AND NEWS

A one-day conference on "Parent Education" will be held on November 2, 1927, at The Hotel Pennsylvania, New York City, under the auspices of the Child Study Association of America, Inc. The Family and the Foundation of Character, The Home's Unconscious Influence on Individual Failure and Success, Opportunities for Parents in Creative Citizenship are the general topics for the three sessions. Mrs. Howard S. Gans, President, and Sidone M. Gruenberg, Director; Drs. Lawson G. Lowrey, Porter Lee, Harry D. Kitson, Frederick V. Robinson, Ernest R. Groves and Arthur H. Ruggles are to be the speakers. The permanent address of the Child Study Association is 54 West 74th Street, New York City.

Smith College announces that in the revision of the curriculum Psychology has been classified as a science, the introductory course being accepted as a course in Experimental Science.

Defective eyesight contributes to juvenile delinquency, according to Guy A. Henry, General Director of the Eye Sight Conservation Council of America. Child Health Day, general observance of which has been asked in proclamations by mayors of cities and other officials throughout the country, should be made an event of moral and physical significance in every household where there are children.

Investigation by the Eye Sight Council has shown that "bad eyes make bad boys," and that the experience of Juvenile Courts prove that defective vision makes children truants. Each year more than 200,000 children come before these courts, and eye conservation in the home and in the schools should be employed as a factor in checking criminal tendencies.

"Juvenile Courts are finding that bad eyesight leads to inattention in school, to unfair competition, and to disrespect for authority. Bad eyes lead to truancy and the truant child is a criminal in embryo."

The University of Rochester, New York, announces the promotion of Dr. Hulsey Cason to a Professorship in Psychology.

Pennsylvania State College reports that Dr. Charles C. Peters, formerly of Wesleyan University, Delaware, Ohio, has been appointed Professor of Education and Director of Educational Research. Dr. B. V. Moore, Professor of Education and Psychology, has been granted leave of absence for 1927–28.

The United States Veterans' Hospital, No. 81, New York City, reports that Dr. George Van Ness Dearborn is engaged in the following investigations: 1st, Qualitative Analysis of the Common Types of Mental Regression and Deterioration; 2nd, continuation of research on the Determination of Mental Regression.

The Commonwealth Fund has renewed its grant for the coming year in order tht Miss Grace Arthur, Psychologist, Child Guidance Clinic, St. Paul, Minn., may prepare and standardize an alternative form of her Point Performance Scale.

The American Psychological Association began the publication of its new journal, *Psychological Abstracts*, with the January, 1927, number. It is edited by Professor Walter S. Hunter of Clark University, assisted by the following distinguished coöperating editors from foreign countries: F. C. Bartlett, Cambridge University; V. M. Bekhterev, Leningrad; Ed. Claparede, University of Geneva; G. C. Ferrari, University of Bologna; A. Michotte, University of Louvain; H. Pieron, Sorbonne; M. L. Reymert, (formerly) University of Oslo, and W. Wirth, University of Leipzig.

The journal is international in character. It consists of non-critical abstracts of articles and books on psychological and cognate subjects, which appear as soon as possible after the original publication. These abstracts are prepared by competent psychologists in America and Europe. They are published in English, and average one hundred and fifty words each.

The scope of *Psychological Abstracts* is indicated by the accompanying classification of its material: General Topics in Psychology, Sensation and Perception, Feeling and Emotion, Attention, Memory and Thought, Nervous System, Motor Phenomena and Action, Plant and Animal Behavior, Evolution and Heredity, Special Mental Conditions, Nervous and Mental Disorders, Social Functions of the Individual, Industrial and Personnel Problems, Childhood and Adolescence, Educational Psychology, Biometry and Statistics, and Mental Tests.

It is the intention of the Association to make *Psychological Abstracts* invaluable, not only to psychologists throughout the world, but also to all persons who are working in allied fields, such as physiology, psychiatry, education and biology.

Sample copies of the January and February issues will be sent for examination on request. The annual subscription rate is $6.00 (overseas $6.25), checks to be made payable to *Psychological Abstracts*. Subscriptions should be sent to H. S. Langfeld, Business Editor, Princeton University, Princeton, New Jersey.

Readers of this JOURNAL will be greatly interested in the announcement of a Symposium on Feelings and Emotions called by Dr. Martin L. Reymert, Wittenberg College, Springfield, Ohio, to mark the opening of the new Laboratory at that institution. The conference will be held October 20–23, with Dr. J. McKeen Cattell acting as honorary chairman.

Many eminent American and European psychologists will take part in the Symposium. Among the former will be found the following: Dr. Langfelt, Princeton; Dr. Cannon, Harvard; Dr. Pillsbury, Michigan; Dr. Jastrow, Wisconsin; Dr. Seashore, Iowa; Dr. Weiss, Ohio State; Dr. MacDougall, Duke; Dr. Washburn, Vassar; Dr. Bentley, Illinois; Dr. Prince, Boston and Dr. Gault, Chicago.

Among the speakers from abroad are Drs. Peiron and Janet, Paris; Dr. Kata, Rosstock; Dr. William Stern, Hamburg; Dr. Joergensen, Denmark; Dr. Gruen, Lithunia; Dr. Kiesow, Turin; Drs. Aveling and Spearman, London; and Dr. Claperede, Geneva.

All who are interested in Psychology are cordially invited to attend this important international event, the members of the American Psychological Association being especially welcome. Those desiring further information concerning railroad and hotel rates, etc., should communicate with Dr. Reymert.

BOOK REVIEWS

F. L. WELLS. *Mental Tests in Clinical Practice.* World Book Company, Yonkers-on-Hudson, New York. 1927. 315 p.

This is undoubtedly the best presentation so far published on the relation of standard current tests to psychological procedure in clinics.

The range of material presented is satisfactory for a student or an examiner without a great deal of experience. As is usual, there is more discussion, directly and relatively, of the Stanford and Kuhlmann Scales than of other less well-known procedures. Most of it is a presentation of interpretations with which the experienced clinical psychologist will fully agree, but the explanation of principles involved is frequently open to question.

The interpretation of material is a sufficient guide for the student who uses the volume as a sourcebook of information, supplementing it with plentiful reference to other texts. It would in no way serve as a direct manual for test-giving. This is a valuable deterrent in keeping the mental tester in his place until he has done the work necessary to relieve him of that classification.

Following a discussion of the intelligence scales is a similar review of group tests and performance tests.

A whole chapter is devoted to the author's method of studying memory, more detailed statement of method being made in this connection. The method used in this chapter clearly exemplifies the functional study of intelligence and is suggestive at least.

The chapter on association tests is complete and, like the chapter on memory, presents details of technique and interpretation.

The discussion of vocational problems is modern but totally inadequate in view of the present demand for this branch of clinical aid.

A brief chapter on the present status of personality testing concludes the book.

In general the book is practical for present-day usage, especially as a college text. It reflects the attitude of the Boston Psychopathic Hospital towards its own use of psychological findings and is consequently valuable to other clinics as a means of comparison with their own principles of psychological usage.

The experienced clinician will find the discussions rather arbitrary at times, but even this is a challenge to his own methods which lends zest to the reading of a worthwhile manual.

FLORENCE MATEER,
Columbus, Ohio.

NILA BANTON SMITH AND STUART A. COURTIS. *Picture-Story Reading Lessons.* Revised.

The first edition of Picture-Story Reading Lessons was put into experimental use in the first grade of four of Detroit's public schools in 1920. Since that time the method has been adopted for city-wide use in Detroit and other places, it has been subjected to constant experimental work, both the method and the material have been simplified and improved, and now a revised edition is offered.

Picture-Story Reading Lessons method is built upon the basic truths, generally accepted by psychologists and educators, that purposeful learning is the only really efficient learning, and that in teaching reading the best results will be secured by the teacher who sees in reading situations a new field in which to give children experience in "purposing."

The method is based on four definite objectives:

To develop the child's power to purpose through reading situations.

To enable him to use his reading ability as a tool in carrying out his purposes from the time of his first contact with the activity.

To provide some means whereby the child may largely teach himself in learning to read.

To permit each child to progress as rapidly as his individual effort and ability will permit.

The materials by which these aims are to be accomplished include a Teacher's Manual and a package of phrase cards. Each pupil is provided with a Practice Pad which contains (1) picture frames, or a printed background in which the important objects are omitted and in their places are printed their names; (2) cut-outs, or a series of printed figures to be cut out, colored and pasted on the frame to make a completed picture and (3) printed directions to guide the child in making the pictures. The pupil also has a Dictionary which he learns to use to help himself in finding out new words, and a Story Book in which there are lesson sheets corresponding to each of the lessons in the Practice Pad.

The lessons cover a vocabulary of 265 words which have the highest frequency in the Thorndike word list and words with the highest frequency in ten common primers but not occurring in the Thorndike list.

The material will usually occupy the time of an average beginning child who is mentally six years of age for approximately fourteen weeks. By means of it he will have mastered the basic elements of the mechanics of reading and be ready to undertake with interest the reading of primers and first readers.

The method used in teaching reading with Picture-Story Reading Lessons, as the objectives clearly indicate, is an abrupt departure from ordinary methods. It is unusual in that it stresses helping the child to teach himself to read and encourages him to develop as fast as his own effort and ability permit. Its strong feature is that by its use children

not only learn to read but they show a marked growth in initiative, self-reliance, concentration and self-criticism. In addition to learning to read, the children are forming desirable habits of work, of independence and ability to direct their own activities.

EDITH M. PEYTON,
University of Chicago.

DONALD A. LAIRD. II. *The Psychology of Selecting Men.* McGraw, Hill Book Company. 1927 (second edition). Pp. 345 + xiii.

This is the second edition of a very interesting book. The first edition has been reviewed previously by Hollingworth in this JOURNAL, 1926, 10, 132. The present reviewer likewise covered this first edition in the *Journal of Personnel Research*, 1926, 4, 409–411.

The first fourteen chapters are identical with those in the previous edition, and little additional need be said regarding them. They deal with the field of employment psychology, individual differences, application letters, the interview, character reading, the applicant's industrial history, methods of measuring employees' success in the job, measurement of certain personal traits, and various statistical methods for evaluating these factors.

The new chapters, XV to XVIII, add distinctly to the value of the work. It has been suggested elsewhere that the first edition was a bit meager in the treatment of employment tests which are perhaps one of the most outstanding techniques used in this field. This lack is somewhat remedied in the present edition. There is a chapter for instance on intelligence tests, giving some of the conventional results as to occupational levels related to intelligence and bringing out the fact that there are jobs for persons of low grade intellect, but that industry is by no means becoming made up of morons. A typical intelligence test (Morgan's) is given by way of illustration.

There is a discussion of some of the limitations of psychological tests. This discussion constitutes probably a salutary off-set to the undue stress sometimes given to these techniques. Tests, according to the author, will not produce an industrial millenium but must be supplemented with considerations of working conditions, training and morale. There are five qualifications which must be considered on the part of the worker, viz., intelligence, personality, knowledge, interests and special abilities. Tests, moreover, should be checked occasionally to see if they are still working properly. If an adding machine ceases to function it is very soon known, whereas a test may become obsolete without anyone realizing it. In the interests of morale tests should never entirely supplant an employment interview and it is advisable to sell the applicants the test as a scheme for determining what is best for them to do rather than for determining whether they are good enough for this job. The importance of standardized test conditions is duly emphasized.

There is another new chapter dealing with emotional makeup of the applicant. The discussion centers around the Colgate introvert-extrovert test, which is presented in full with scoring methods. Some uses of the measures are suggested. For instance the fact that foremen tend to be extrovert while inspectors are introvert, has obvious implications regarding promotion of workers to these grades. It is further brought out that introverts seem to get along better with other introverts, and vice versa. There is also a discussion of social intelligence tests and an example of such a test devised by Moss is given in full.

The final chapter deals with interests, special abilities and education. Under the first of these we have a little discussion of the interview as a means of determining interests. Under special abilities there is mention of such things as filing or typing, and under education such things as spelling.

The book as a whole is a valuable contribution to this field and would seem especially suitable for arousing the interest of the business man in the possibilities of employment psychology. The numerous charts greatly facilitate the presentation. There are also many commendable and novel features which bring out various points in rather striking fashion. For instance the reader is required to estimate intelligence of persons from their photographs with a key appended, or a picture is given of a stitching room in which every member is feebleminded. The style is terse, readable and interesting. The new chapters very appreciably add to the value of the work. It is of course impossible for a single book to say everything that should be said in this field. Some readers may still feel that the actual procedure of developing employment tests has not been sufficiently outlined, but the author of course is not writing a manual. All the matters discussed are germane and are presented in a very readable style. The reviewer is not at all surprised that the book went to a second edition.

HAROLD E. BURTT,
Ohio State University.

GEORGE BURTON HOTCHKISS AND RICHARD B. FRANKEN. *The Measurement of Advertising Effects.* Harper and Brothers Company, New York. 1927. Pp. xvi + 248.

Aside from bargain sale advertising and a few other types which bring about immediate and easily measurable results, there is some question in the minds of many advertisers as to whether it really does pay, after all, to advertise. Hotchkiss and Franken have in a large measure given a definite answer to this question. Following up the association tests of Geissler, they made two extensive investigations of advertised commodities. In the first, referred to as the 1921 test, about 1000 subjects, half men and half women, well distributed geographically,

were asked to give the first trade name or manufacturer's name that came to mind in response to each of 100 commodities. In the 1925 test 1000 subjects were asked to give as many manufacturers' names or brands as they could (up to 10) for a list of 10 carefully chosen commodities. They were also asked to state what brand they were now using, how long they had used it, and what other brands they had used.

By a careful analysis of the data thus procured the authors are able to show the influence of use and of advertising upon public familiarity and buying habits are also traced. The 10 commodities used in the 1925 test are so chosen as to meet a wide range of conditions. The list contains the names of articles such as cigarettes that cost little and are purchased often, and articles such as watches which are more costly and are purchased seldom. Similarly other variations in type of commodity are taken care of. Each commodity is analyzed in turn. Among the most interesting findings is the change in public familiarity or prestige of certain brands between 1921 and 1925. The relation between these changes and the advertising policies of the various companies represented is pointed out.

Differences between users and non-users in degree of familiarity with trade names, sectional differences, sex differences in brand familiarity and other interesting and important variations are shown. While in the early chapters of the book various factors and principles relevant to the study are discussed in a general way, the authors refrain from indiscriminately mixing opinion with the interpretation of their data. The later chapters consist almost entirely of a presentation and interpretation of their results.

Essentially a monograph rather than a popular treatise, this work should make a rather wide appeal to those who have more than a superficial interest in the psychological aspects of advertising.

AMOS C. ANDERSON,
Ohio University.

H. E. BURTT, PH.D. *Principles of Employment Psychology.* Houghton, Mifflin Company, New York. 1926.

This text-book on employment psychology is exactly what one who has read Burtt's earlier articles on this subject would expect. It is a sound, conservative, and thoroughly workmanlike accomplishment. It meets all the generally accepted requirements of a good text-book, in form, content, bibliography, segregation of technical detail, and proper distribution of emphasis.

Such uniformity of merit makes the task of a reviewer difficult, since no single virtue of the book stands out and no serious fault obtrudes. Its thesis is: "The problem of employment psychology consists of determining what mental capacities are needed for a given occupation and

devising methods of measuring those capacities. These measurements may then be used upon applicants to determine their probable success in the occupation" (p. 4). The presentation of measures is preceded by a critical discussion of "psychology gold bricks"—astrology, spiritualism, telepathy, phrenology, physiognomy. Results of statistical studies which disprove pseudo-scientific claims are presented. A chapter on the History of Vocational Psychology gives an interesting background to the subsequent discussion of the specific problems of employment.

Types of mental tests are then taken up, under two general classifications—tests that measure proficiency, and tests that measure capacity. Following this are chapters on Mental Test Technique, The Criterion, The Subjects Used in Evaluating Tests, Special Capacity Tests, Intelligence and Vocational Aptitude, Interests in Employment Psychology, Rating Scales, Miscellaneous Determinants of Vocational Aptitude, Trade Tests, Job Analysis, and a concluding chapter on The Outlook for Employment Psychology. An appendix on the technique of correlation, one on combining rankings with incomplete data, and a third on the derivation of a regression equation, with a comprehensive biography, complete the book.

In the course of the book is brought together a mass of material, drawn from many sources, to illustrate the various ideas presented. From this viewpoint alone, Burtt's book is a valuable addition to the literature on this subject.

HENRY C. LINK.
Lord & Taylor, New York City.

CARL MURCHISON, Editor. *Psychologies of 1925*. Clark University, Worcester, Mass. Pp. 412.

In this day of many conflicting points of view in psychology it is a valuable service to present in one volume clear statements by those representing various "schools." The Psychologies of 1925 comprises a series of lectures at Clark University known as the Powell Lectures in Psychological Theory. The contributors are: Bentley, Dunlap, Hunter, Koffka, Köehler, Prince, McDougall, Watson and Woodworth. The psychologies represented are: Behaviorism, Dynamic Psychology, Gestalt, Purposive Psychology, Reaction Psychology and Structural Psychology. It would be quite out of the limits of any series of lectures to have all of the existing theories presented and, on the whole, the selection here made seems to have been wise. Not all of the lectures are really devoted to theory—less than one of Watson's three, for example, the remainder being given to description of laboratory investigations which might have been conducted by the adherents of any of the theories now prevalent; and not all of the space given to a given school is used in the exposition of the theory of that school—frequently much time is

taken to point out the errors of those holding opposing opinions. These characteristics are desirable or undesirable according to the reader. To the one already well schooled in psychological theory it would have been more pleasing had all controversy been eliminated but to the student using the book as a means of becoming acquainted with the views of psychology it is well that alleged fallacies of the various schools be pointed out by the opponents of the schools. The lack of balance of emphasis given to the various psychologies is undoubtedly due to the exigencies of administration of the lectures.

In the opinion of the reviewer, all of the lectures are worth reading and the book as a whole makes a distinct contribution to the literature of psychology.

R. M. Ogden. *Psychology and Education.* Harcourt, Brace and Company, New York. Pp. 364.

In this book one of the first men in this country to embrace the Gestalt theory of psychology—it will be remembered that Ogden translated Koffka's *Growth of Mind*—has attempted to write an educational psychology in terms of that theory. This fact alone makes the work important. Because some of the new points of view are so divergent from the "accepted" ones—it is hard for the conventional psychologist to conceive of reflexes as being derived from instincts rather than prior to them, for example—the book is not, the reviewer believes, suited to beginning students. Many sections of it are, however, worthy of most careful study by advanced classes. The chapters on original forms of behavior, perception, and learning are of particular value. Some of the other sections have about them little of unusual character. The classification and much of the discussion of instincts for example is uncritical and neglects important recent evidence. The book is not easy to read. As has been said, however, the volume is a noteworthy one and belongs in the psychologist's professional library.

Lawrence W. Cole. *Factors of Human Psychology.* Extension Division, University of Colorado. 1926. Pp. 362.

In this day when so many try to write texts in such a way that they may be used in (and royalties derived from) many courses, it is refreshing to find a writer who is content to limit his task. In this book by Cole "No attempt has been made to give an account of animal psychology, nor of applied psychology except as facts from that realm may illustrate psychological principles. The endeavor has been made to lay a foundation for business, industrial and educational psychology in the facts selected for discussion." This endeavor has been well realized. The text does lay a foundation for later applied courses without unduly anticipating them. The book is made interesting by the frequent use of

that sort of commonplace illustration which good teachers employ in class but which they seldom seem able to get into their texts. Numerous authorities are quoted—somewhat more of them than in most texts being writers from outside this country and somewhat fewer of them being contemporary. The author's own point of view is apparently predominantly of the structuralistic order and it seems that he has found no product of the behavioristic school worthy of mention. The reviewer does not agree with all of the conclusions drawn; for example, that the acceptance of evidence that the quick learner retains better than the slow learner implies an endorsement of cramming. But the points of disagreement are usually minor and in any event a text that provokes disagreement is not for that reason to be condemned. It is disturbing that bibliographical references are incomplete—particularly that dates of publication are omitted. But the book is interesting and teachable. It is well adapted for a text. The number of pages is smaller than that of the average text, but there are some nine more lines to the page than is customary so in reality the book is of fully average size.

D. A. Worcester,
Ohio University.

NEW BOOKS AND PAMPHLETS RECEIVED*

Books and pamphlets for review should be sent to James P. Porter, Department of Psychology, Ohio University, Athens, Ohio.

Applied Psychology. A. T. Poffenberger. D. Appleton Company, New York City, 1927. $4.00. 586 pp.

The Cost of Living in Foreign Countries. National Industrial Conference Board, Inc., New York City, 1927. $3.50. 402 pp.

Fear. John Rathbone Oliver. Macmillan Company, New York City. $2.50. 366 pp.

Inner World of Childhood, The. Frances G. Wickes. D. Appleton Company, New York City. $3.00. 380 pp.

Proceedings of Management Week—Business Statistics Section, Part I. Bureau of Business Research, College of Commerce and Administration, Ohio State University, Columbus, Ohio. 50¢. 72 pp.

Psychology of Secondary Education. Charles Hubbard Judd. Ginn & Company, 1927. 545 pp.

Scales for Rating Pupils' Answers to Nine Types of Thought Questions in 1, American History; 2, Civics; 3, English Literature; 4, General Science. Charles W. Odell. Bureau of Educational Research, University of Illinois, Urbana, Ill., 1927.

The Supplementary Reading Assignment. Carter V. Good. Warwick & York, Baltimore, Md., 1927. 227 pp.

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* Mention here does not preclude further comment.

Directory of American Psychological Periodicals

American Journal of Psychology—Ithaca, N. Y.; Morrill Hall.
Subscription $6.50. 600 pages annually. Edited by M. F. Washburn, K. M. Dallenbach, M. Bentley, E. G. Boring. Quarterly. General and experimental psychology. Founded 1887.

The Pedagogical Seminary and Journal of Genetic Psychology—Worcester, Mass.: Clark University. Subscription $7. 700 pages annually. Edited by Carl Murchison and an international co-operating board. Quarterly. Child behavior, differential and genetic psychology. Founded 1891.

Psychological Review—Princeton, N. J.: Psychological Review Company.
Subscription $4.25. 480 pages annually.
Bi-monthly. General. Founded 1894. Edited by John B. Watson.

Psychological Bulletin—Princeton, N. J.: Psychological Review Company.
Subscription $5. 720 pages annually. Psychological literature.
Monthly. Founded 1904. Edited by Samuel W. Fernberger.

Psychological Monographs—Princeton, N. J.: Psychological Review Company.
Subscription $5.50 per vol. 500 pp. Founded 1895. Ed. by Shepherd I. Franz.
Published without fixed dates, each issue one or more researches.

Psychological Index—Princeton, N. J.: Psychological Review Company.
Subscription $1.50. 200 pp. Founded 1895. Edited by Walter S. Hunter.
An annual bibliography of psychological literature.

Journal of Philosophy—New York; 515 W. 116th St.
Subscription $4. 728 pages per volume. Founded 1904.
Bi-weekly. Edited by F. J. E. Woodbridge and Wendell T. Bush.

Archives of Psychology—Sub-Station 84, N. Y.: Archives of Psychology.
Subscription $5. 500 pp. ann. Founded 1906. Ed. by R. S. Woodworth.
Published without fixed dates, each number a single experimental study.

Journal of Abnormal Psychology and Social Psychology—Albany, N. Y.
Subscription $5. Boyd Printing and Publishing Co. Edited by Morton Prince in co-operation with Floyd H. Allport.
Quarterly. 432 pages annually. Founded 1906. Abnormal and Social.

Psychological Clinic—Philadelphia: Psychological Clinic Press.
Subscription $2.50. 288 pages. Ed. by Lightner Witmer. Founded 1907.
Without fixed dates (9 numbers). Orthogenics, psychology, hygiene.

Training School Bulletin—Vineland, N. J.: The Training School.
Subscription $1. 160 pp. ann. Ed. by E. R. Johnstone. Founded 1904.
Monthly (10 numbers). Psychology and training of defectives.

Comparative Psychology Monographs—Baltimore: Williams & Wilkins Co.
Subscription $5. 500 pages per volume. Edited by W. S. Hunter.
Published without fixed dates, each number a single research.

Psychoanalytic Review—Washington, D. C.: 3617 10th St., N. W.
Subscription $6. 500 pages annually. Psychoanalysis.
Quarterly. Founded 1913. Ed. by W. A. White and S. E. Jelliffe.

Journal of Experimental Psychology—Princeton, N. J.
Psychological Review Company. 480 pages annually. Experimental.
Subscription $4.25. Founded 1916. Bi-monthly. Ed. by Madison Bentley.

Journal of Applied Psychology—Baltimore: Williams & Wilkins Co.
Subscription $5. 400 pages annually. Founded 1917.
Quarterly. Edited by James P. Porter and William F. Book.

Journal of Comparative Psychology—Baltimore: Williams & Wilkins Co.
Subscription $5. 600 pages annually. Founded 1921.
Bi-monthly. Edited by Knight Dunlap and Robert M. Yerkes.

Journal of Personnel Research—Baltimore: Williams & Wilkins Co.
Subscription $5.00. 500 pages approximately. Edited by Walter V. Bingham, Lewis L. Thurstone, and Clarence S. Yoakem. Monthly.

Genetic Psychology Monographs—Worcester, Mass.: Clark University.
Subscription $7. 600 pages annually. Edited by Carl Murchison and an international cooperating board.
Bi-monthly from January, 1926. Each number one complete research. Child behavior, differential and genetic psychology. Founded 1925.

Psychological Abstracts—Princeton, N. J.
Subscription $6.00. 600 pages ann. Edited by W. S. Hunter. Monthly.
Abstracts of psychological literature. Founded 1927.